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(54) Title: METHOD AND SYSTEM FOR PROVIDING MEDICAL INFORMATION

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(57) Abstract: A system and method for providing medical information by way of a computer network. The system may include a content gathering subsystem that locates networked resources (36) having content that includes medical information. The content may be downloaded to a context engine (204) that indexes the content using a hierarchically indexed identification code. The system may provide medical advice to a patient by way of a folder (142) stored by the system. Each folder (142) may have access privileges that can be set by the respective user. A communication server (70) permits the patient to access the folder (142) and submit requests for medical advice to medical professionals. This allows the patient to access the information selected by the medical professional. The invention may provide a system and method for displaying contextually relevant e-commerce service at a computer. The computer can display a hyperlink (352) to information. The hyperlink (352) is associated with a hierarchically indexed information cod based on the specificity of the information. An e-commerce service item (355) corresponding to the identification code is selected and displayed along with the link (352).

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5                   METHOD AND SYSTEM FOR  
                 PROVIDING MEDICAL INFORMATION

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TECHNICAL FIELD

The present invention relates generally to information systems, and in particular, to a system and method for distributing medical information over a computer network.

20

BACKGROUND OF THE INVENTION

25                  Websites currently exist for providing medical information to remote users by way of the World Wide Web (WWW). The information provided by these sites includes general background information, medical encyclopedias, physician reference materials, information on medical therapies and procedures, research articles, etc.

An individual seeking medical information by way of the WWW faces numerous problems. One is the trustworthiness of the medical information. There are a vast number of Websites purporting to provide medical information. Much of the content provided by these sites does not accurately reflect the views or practices of the medical community. Accordingly, a filtering mechanism is needed to identify accurate and reliable medical information on the WWW.

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Another problem faced by an individual seeking medical information is the lack of organization of information available on the Web. Search engines are commonly employed to locate Web resources and information. However,

- 5 currently available search engines do not retrieve medical content in a concise manner. Typically, a search engine will identify a large number of Website in response to a query, many of them containing irrelevant information. Therefore, there is also a need for a concise and accurate means of searching the medical content available on the WWW.
- 10 A physician, for example, may not have a good source of current literature they can provide their patients which relates specifically to the patient's medical condition. In addition, there is no convenient way for the physician to modify, comment upon and share their information with the patient. It would accordingly be desirable to have a system that would provide
- 15 physician and patients, as well as, other individuals a convenient means to share medical information.

Once an individual finds the specific medical information, existing Websites do not provide commerce solutions directly linked to the specific medical information. It would accordingly be desirable to have a system that

20 would provide commerce solutions providing convenient and efficient access for the individual.

Individuals may not have a good source of current medical literature that they can share with others which relates to a specific topic. It would accordingly be desirable to have a system that would provide individuals a

25 convenient means to share medical information.

Currently available medical information is not organized on the WWW in a manner to allow access to specific information relating to a medical problem. It would accordingly be desirable to have a system that would classify medical information in a manner that would allow convenient access

30 to individuals.

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**BRIEF DESCRIPTION OF THE DRAWINGS**

The invention is pointed out with particularity in the appended claims.

The following drawings and detailed description are merely illustrative of the  
5 Invention, rather than limiting. The scope of the invention is defined by the  
appended claims and equivalents thereof. Accordingly:

**FIG. 1** is a block diagram illustrating a system in accordance with one  
embodiment of the present invention;

10 **FIG. 2** is a block diagram illustrating a system in accordance with  
another embodiment of the present invention;

**FIG. 3** is a block diagram illustrating the details of the application  
server shown in **FIG. 2**;

**FIG. 4** illustrates database tables includable in the link database of  
**FIG. 2**;

15 **FIG. 5** illustrates a first architecture permitting physicians to modify the  
link database;

**FIG. 6** is an alternative architecture permitting physicians to modify the  
link database;

20 **FIG. 7** illustrates the hierarchical folder structure of a member research  
space;

**FIG. 8** is a block diagram showing a user interface to a member  
research space;

**FIG. 9** illustrates an exemplary screen displaying a member folder  
space;

25 **FIG. 10** illustrates an exemplary screen displaying details of a member  
folder space;

**FIG. 11** shows an exemplary screen displaying a form for adding new  
sub-folders to a member folder space;

30 **FIG. 12** shows an exemplary screen displaying a form for adding a link  
into a folder;

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**FIG. 13** shows an exemplary screen for displaying a member interface to the sharing functionality;

- FIG. 14** shows an exemplary screen for creating share groups;  
5      **FIG. 15** shows an exemplary screen for editing share groups, including membership;

- FIG. 16** shows an exemplary screen for sharing groups to users;  
10     **FIG. 17** shows an exemplary screen for adding members to a share folder;  
**FIG. 18** shows a flow chart diagram illustrating details of the sharing functionality;

- FIG. 19** is a process flow diagram illustrating details of the content gathering subsystem;  
15     **FIG. 20** shows a flow chart diagram of a method of classifying documents;

- FIG. 21** shows a tree diagram illustrating a higher hierarchical index of terms;  
20     **FIG. 22** shows a flow chart diagram illustrating a method of performing a natural language search;  
**FIG. 23** illustrates an exemplary screen displayed as a result of a natural language search;  
25     **FIG. 24** shows a flow chart diagram illustrating a method of displaying medical product information; and  
**FIG. 25** illustrates an exemplary screen displaying medical information and corresponding product information.

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**DETAILED DESCRIPTION OF THE  
PRESENTLY PREFERRED EMBODIMENTS**

It is an advantage of the present invention to provide a computer system that distributes reliable medical information to users by way of a communication network. The system achieves this by providing a user-accessible database identifying networked data resources having trustworthy medical content.

Turning now to the drawings, and in particular to FIG. 1, there is illustrated a system 30 in accordance with one embodiment of the present invention. The system 30 includes an information resource system 32 communicating with a plurality of user terminals 34 and a plurality of networked resources 36, such as information servers, by way of a communication network 38. The networked resources 36 can store any type of information, including medical information. The information retrieval system 32 permits users to selectively access the medical information stored by the network resources 36. To accomplish this, the information retrieval system 32 includes a database 40 and a database interface 42. Users can remotely access the database interface 42 from the user terminals 34.

The database 40 stores the locations of the networked resources 36 having medical information. Each of these stored locations is associated with a hierarchically-indexed identification (ID) code to create a plurality of database records. The hierarchically-indexed ID codes are derived from a classification scheme for medical information. The classification scheme itself can be represented by a knowledge matrix, as will be discussed in further detail below.

Each of the ID codes can consist of a sequence of individual alphanumeric symbols, each symbol corresponding to a particular medical term. The sequence can be ordered according to specificity, with symbols representing more general medical terminology appearing first, followed by symbols representing more specific medical terms.

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The database interface 42 allows users at the user terminals 34 to selectively retrieve at least one of the locations from the database 40. The user selection can be based on the hierarchically-indexed ID code. For 5 example, a search engine may be used to retrieve article locations having particular ID codes, where the ID codes are determined from a user query.

The networked resources 36 can include any data storage device or format accessible over a network. Such resources can be Websites or database servers storing medical publications, or even a single Web page 10 containing medically-related text.

The locations of the networked resources can be network addresses, suitable for directing a user to the resources, such as uniform resource identifiers (URIs) usable with the Internet and the WWW. By retrieving a location from the database, a user can then directly access the corresponding 15 networked resource to review the desired medical information.

The user terminals 34 can be configured to respond to the locations retrieved from the database 40 so that users can seemlessly connect to the appropriate networked resources 36 storing the sought-after medical information. Although not so limited, the user terminals 34 can be personal 20 computers (PCs) or workstations running commercially-available Web browser software for connecting to networked resources located on the WWW, such as Websites. In addition, the user terminals 34 can be Web access devices, such as Web pads, personal digital assistants (PDAs), cellular phones, or any other Web-enabled device, wireless or wired.

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The communication network **38** can include any suitable communication protocol and path for transferring information between the user terminals **34**, the networked resources **36**, and the information resource system **32**. For example, the network **38** can include wireless and/or wireline links, and can involve the use of the public switch telephone (PSTN) and/or private networks, such as local area networks (LANs) and enterprise-wide intranets.

**FIG. 2** illustrates a system **60** in accordance with another embodiment 10 of the present invention. The system **60** includes a Website **62** in communication with a plurality of medical Websites **64** and user browsers **66** by way of the WWW **68**.

The Website **62** includes a communication server **70**, an application server **72**, and a content gathering subsystem **84**. The site **62** also includes a link database **74**, a member database **76**, a product database **78** and a patient-to-physician database **80**. These databases **74-80** are all accessible by the application server **72**. Also, a plurality of member research spaces **82** is provided by the site **62**. The member research spaces **82** are all accessible to the application server **72**.

20 The communication server **70** can be a commercially-available HTTP server for communicating with various networked resources, such as the browsers **66** and medical sites **64**, over the WWW **68**. The communication server **70** is configured to manage connections to the Website **62**, and can include a security device, such as a firewall, which can be implemented by 25 using a commercially-available software program or separate server, for denying unauthorized or malicious access to the site **62**.

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The application server 72 provides services as disclosed herein to users accessing the site 62 by way of the Web 68. The server 72 may be implemented using conventional application server software, such as, for 5 example, the Apache Server available from the Apache Software Foundation ([www.apache.org](http://www.apache.org)). Software modules for the server can be programmed to direct the server to perform the functions of the application server 72, as well as the functions of the communication server 70. The application server may be combined or separate from the web server.

10 The content provided by the site 62 can be served to clients using any suitable markup language, such as, for example, HTML or XML.

FIG. 3 is a block diagram illustrating the services provided by one embodiment the application server 72. The application server 72 is configured to provide online registration 100, member log-in and account 15 administration 102, maintenance of member research space 104, sharing functionality 106, contextual e-commerce services 108, a search engine 110, and patient-physician messaging 112.

The online registration service 100 permits users to register as system members. The service 100 can present electronic forms to first-time users at 20 their browsers 66 for gathering user information, such as name, e-mail address, home or business address, phone number, or the like. The registration service 100 can also ask a user whether he/she is a licensed physician, and if so, their medical specialty and specific licensing information. The service 100 can also include alternative means for registering members, 25 such as an automated telephone registration system or manual operator entry of printed user information.

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As a result of receiving user information, the registration service **100** establishes corresponding member accounts having a login and user ID access requirements. Each member account includes a personal research space **82** for storing information and data. Different member privileges can be established for non-physicians and physicians, as will be discussed in further detail below.

- 5 Member information gathered by the online registration service **100** is stored in the member database **76**.
- 10 The login/administration service **102** handles conventional Website management functions, such as verifying user IDs and passwords for incoming connection requisitions, updating member information, gathering usage and load statistics, or the like.
- 15 The member research space maintenance service **104** creates and maintains at least one research space for each member. As illustrated in FIG. 7, the maintenance service **104** can create a file system for each member for storing information, such as, for example, medical articles, general background information, network addresses or links to Web resources, messages from other members, physician diagnosis, or the like.
- 20 The file system can include a plurality of hierarchically-arranged folders for storing the information. The maintenance service **104** can pre-populate the folders based on member information gathered during the online registration process. For example, if the member is a urologist, the service **104** can initially place into the urologist's personal space folders of medical links to resources containing information pertaining to urology. The folders can be organized according to specificity of information, with the most general information appearing at the top of the hierarchy, and the most specific at the bottom.
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In addition, the maintenance service **104** can also establish access privileges for each member research space. Like the pre-populating function, the access privileges can be based on the member information gathered by 5 the registration service **100**. For example, a patient member research space will have read/write privileges to the space for the respective patient. Additionally, the service **104** can establish write privileges to the space for the patient's physician(s).

The file structure and privilege information of the research spaces can 10 be stored in the member database **76**, on a per member basis.

The patient-physician messaging service **112** provides a secure communication path between member patients and physicians. Among other things, the messaging service **112** permits patient members to submit requests for medical advice to selected physicians. A physician can respond 15 by sending a message back to the respective patient such that the message is made available in the patient's research space. The physician's response can include links to networked resources having relevant medical information.

The patient-physician database **80** stores look-up tables associating physician members with specific patient members.

To ensure privacy, messages between patients and physicians can be 20 exchanged using a standard protocol, such as the secure sockets layer (SSL) protocol. The SSL protocol permits private connections between the browsers **66** and the site **62**. These connections allow encrypted messages to be exchanged between patient and physician members. The messages 25 can be encrypted using standard encryption algorithms, such as, for example, DES, RC4, or the like.

The messaging service **112** can also provide an interface displayable at the browsers **66** that allows patient members to select physicians. The interface can access member physician information from the database **76** and 30 display it in a manner that allows patients to select physicians by way of the browsers **66**. The member physicians can be selected by specialty or name. Also, a search engine (not shown) can be provided that permits patient members to search for physicians by specialty, geographic location and/or

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name. The patient/physician associations generated through this interface can be stored in the patient-physician database 80.

The sharing functionality 106, search engine 110, and e-commerce services 108 are described in further detail below, in connection with

5 **FIGS. 13-18 and 22-25.**

Referring to FIG. 4, illustrated is a link table 120 and an ID code table 122 includable in the link database 74. The link database 74 stores addresses of networked resources having medical content and their associated ID codes. To accomplish this, the link table 120 includes records 10 for each networked resource classified by the site 62. Each record 124 can include the following fields: an ID number, a network address such as a URI, a title, a date of publication, a date entered into the link database 74, and a date of last update, indicating the last time the database record was updated. If a URI is provided as the network address, the URI can be either a uniform 15 resource locator (URL) or a uniform resource number (URN).

The ID code table 122 can include a plurality of records 126, each corresponding to a link record in the link table 120. Each of the link records 126 can include the ID field and an ID code field. The ID code field stores a hierarchically-indexed (ID) code assigned to the link.

20 The link database 74 is provided as a common resource accessible to all members. Members, both physicians and patients alike, can search the database 74 to access the various medical information available on the WWW. The WWW resources identified in the database 74 are reviewed by medical personnel to ensure content quality and integrity.

25 Although the medical information identified by the database 74 has passed through a pre-qualification process, it is recognized that not all medical practitioners will agree with the content. Accordingly, a mechanism can be provided by the Website 62 that permits individual physicians to modify the link database contents to suit their specific views or needs.

30 FIG. 5 illustrates a first architecture for permitting member physicians to modify the contents of the link database. The first architecture 129 provides a copy of the link database 74 to each physician who desires to modify the link database 74. The application server 72 is configured to permit individual member physicians to either add or delete links in his/hers

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respective copy of the database. In addition, the application server provides an interface allowing individual physicians to annotate individual links as the physician sees fit. Under this scheme, the site 62 stores a modified link database 130 for each physician making changes to the original link database

5   **74.**

**FIG. 6** illustrates an alternative architecture 132 that also permits physicians to modify the link database 74. Instead of maintaining a plurality of modified link databases 130, the second architecture 132 provides a plurality of physician filters 134. The physician filters 134 are software modules that  
10 track the changes made by individual physicians. Accordingly, for each physician wishing to change the link database 74, an interface is provided by the application server 72 that permits the physician to add or delete links from the database 74. These changes are recorded in a file corresponding to the physician member ID. This file is used by the corresponding physician filter  
15 134 to then modify the availability of specified links in the database 74 each time the physician subsequently accesses the database 74.

**FIG. 7** illustrates a hierarchical folder structure that can be included in each of the member research spaces 82. The folders can be used to store information from the link database 74, such as the addresses of networked resources containing relevant medical information and brief descriptions or titles corresponding to the medical information. The folders can be organized according to a hierarchical index of medical terms. For example, the first level of the hierarchy 152 can correspond to general information. The lower levels of the hierarchy 154, 156 can be used to store more specific information. For example, folder A 152 can be used to store information on digestive diseases. The second level folder, folder A:1 154 can be used to store more specific information on digestive diseases, such as GI tract diseases. The lower level folders 156 can store even more specific information, such as information on peptic ulcers.

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**FIG. 8** is a block diagram illustrating various aspects of a user interface to the site **62**. The user interface allows a user to access his/her personal research folder. The research folder, labeled "MyResearch," can be accessed from one of the browsers **66** using a hyperlink or a bookmark to the folder (box **140**). A cookie file can be stored at the user's browser, providing necessary login information such as a user ID and the password. If a cookie file is not available, the link to the user interface accesses a login screen **141**. The login screen presents a form for entering the user name and password.

Additionally, if the user is not yet a member, a registration link **151** is provided to permit the user to access a registration form **143**. The registration form **143** allows the user to enter registration information to become a member of the site **62**.

If a cookie file is available at the browser, the hyperlink connects directly to the member folder **142**. The member folder space presents a toolbar **160**, a legal disclaimer, and displays the folders and links stored in the folder space **142**.

The toolbar **160** provides one or more links that allow the user to manage the member folder space. The home link returns the user to the MyResearch display **142**. As will be discussed in connection with **FIG. 12**, the new URL link permits the user to store a new link within the folder space **142**. The edit/delete link permits the user to edit or delete existing links and folders in the folder space **142**. The recycling bin link allows the user to temporarily place links and folders in a recycling bin folder associated with the user. The recycling bin includes additional links (not shown) for selectively permanently deleting the folders or links in the recycling bin or restoring them to the folder space **142**.

As will be discussed in connection with **FIGS. 14-15**, the groups link presents a page **144** that allows the user to create new groups and edit existing groups. The new group function can present a page **145**, allowing the users to selectively add other members to the group.

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The sharing link presents a page **146** that allows the user to share groups and folders with other users. The sharing functionality is further discussed in connection with **FIGS. 13, 16-17**. The page **146** provides links to 5 pages **147-148** for editing sharing grants and selecting and setting user permissions, respectively.

The opt in link presents a page that allows the user to accept or decline, on a per-user or per-share basis, invitations from other users to join share groups and folders. The opt in link presents a page **153** that allows a 10 user to accept or decline the invitations. In addition, the page **153** provides a link that allows the user to permanently decline share offers from specific members.

**FIGS. 9-17, 23 and 25** show various computer screen displays that can be presented to users at the browsers **66**. The content of the displays can be 15 provided by the site **62** and represented by HTML pages transferable over the Web **68** using HTTP. The displays can also be represented using other markup languages, such as, for example, XML.

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**FIG. 9** shows a computer screen display of a member folder space window 158. In the example shown, the top-level folder is entitled "My Research." Beneath the My Research folder, subfolders on the subjects of 5 "Sports," "Apache" and "Lymphoma" are displayed. Each of the displayed folders can be hyperlinks to pages at the site 62 that contain information selected by the member.

In addition to displaying the folders, titles and links, the window 158 can also display a member-created description of each folder. An example of 10 this member-created description is shown for the Lymphoma folder. The description appears as text displayed next to the folder title in the window 158.

**FIG. 10** shows a window 159 displaying further details of a member folder space. The window 159 includes a toolbar 160 that displays hyperlinks to functions for configuring the member folder space. These functions include 15 a link for creating a new folder, adding new URL links into a folder, editing/deleting existing links and folders, as well as links for creating sharing groups and sharing folders. The window 159 illustrates links 161 to network resources containing medical information. In the example shown, links to "AMDF" and "heathcrite.com" are shown. In addition to displaying the links, 20 member comments regarding the links can also be displayed in the window 159. Such comments are illustrated for the healthcrite.com homepage link.

**FIG. 11** shows a window 162 displaying a form for adding a subfolder in a member research space. The form can be displayed at a browser 66 in response to a member clicking on the new folder link in the toolbar 160. The 25 form permits the member to enter a folder name and member comments that can be displayed in the member folder space, as illustrated in **FIG. 8**.

**FIG. 12** shows a window 164 displaying a form for allowing a member to add a new link into his/her research space. The form permits the member to enter the URL. In addition, the member can enter a name for the link and 30 comments associated with the link. The member-assigned name and comments can be displayed in the member folder space, as shown in **FIG. 9**.

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**FIG. 13** shows a window 165 displaying a member interface to the sharing functionality 106. The member interface includes a group sharing interface 166 and a folder sharing interface 167. The group sharing interface

- 5 166 permits members to create member groups for sharing information. Information submitted by group members is distributed to all group members. The group owner can add members and assign them read/write privileges.

The group sharing interface 166 can include a revoke button 168 that permits a group owner to remove privileges of an existing group member.

- 10 The interface 166 also includes a share button 169 for adding new members to the group.

The folder sharing interface 167 allows a member to share specific folders and their content with other members. The member can grant read/write access privileges for folders in his/her research space. As 15 illustrated in the example, a share button 171 is provided for each of the member folders. The share buttons 171 permit the member to selectively grant access to other members. A revoke button 170 allows the member to revoke access privileges previously granted to other members.

- The folder sharing interface 167 can be used by a patient member to 20 grant write privileges to a physician member so that the physician can write messages and medical links into the patient's folder in response to the patient's prior request for medical advice.

- FIG. 14** shows a window 172 for presenting a form for creating groups. A member can access this form by clicking on the groups link included in the 25 toolbar 160. The create group form allows the member to enter a group name and a short group description. After the form is submitted, the member is identified as the group owner and can then add group members.

- FIG. 15** shows a window 173 displaying a form permitting a group owner to update a group. The form includes fields permitting the member to 30 enter the group name or group description. The form also includes one or more remove buttons 174, associated with each current group member, permitting the group owner to remove members. A field 175 is also provided for adding new members. A member search engine (not shown) is provided for searching the member database 76. The search engine can be invoked

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by entering a partial-member name in the field. Also, the search engine can check the database 76 to ensure that the entered name is in fact that of a member. The added member's name can be found by searching the member database, for example, either by last name or by user name.

5       **FIG. 16** shows a window 176 displaying a form for sharing a group to other users. The form shows the name of the group to be shared and permits the individual sharing the group to enter the user's name and designate the privileges to be granted.

10      **FIG. 17** shows a window 177 displaying a form for permitting a member to establish read/write privileges for folder sharing. The form displays the name of the sharing folder and includes fields for entering the member's name and the access privileges to be granted to the member.

15      **FIG. 18** shows a flow chart diagram 180 illustrating the operation of the sharing functionality 106. The sharing functionality 106 permits a member to share information with other members. In step 182, the member submits a request to share information stored in his/her folder with another member. The request can be generated as a result of the member submitting the share folder form 177 shown in **FIG. 17**. The request can be received and processed by the application server 72. The member request includes the identification of the intended recipient, as well as the identification of the information sought to be shared. Upon receiving the request, the application server 72 accesses an authorization table to determine whether the recipient has authorized sharing. The authorization table includes IDs, share member IDs and associated read/write privileges. If the transfer of information is 20 authorized by the intended recipient, the information link is transferred into a folder included in the recipient's member research space (step 188). The information link can be a link to a share folder or to a particular networked resource. If the authorization table does not indicate that information sharing is allowed between the user and the intended recipient, the sharing 25 transaction is put on hold and the intended recipient is notified of the request (step 186). The intended recipient can be notified by e-mail or by providing a message to the recipient when he/she next logs into the system.

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- Upon being notified of the request to share information, the recipient can either accept or decline the information (step 190). If the intended recipient accepts the shared information, the information link is transferred  
5 into the recipient's folder (step 188). Otherwise, the sharing request is declined.

**FIG. 19** is a process flow 200 illustrating the details of the content gathering subsystem 84. The content gathering subsystem 84 includes an agent 202 and a context engine 204. The agent 202 can be a "spider" for  
10 retrieving information from Web pages. Spiders are software programs executing at a host site that access public Websites and download pages for further processing. They are used to gather information from various sites and make it available through a single site.

In the system disclosed herein, the agent is configured to access  
15 Websites in parallel, using the context engine as described below to check each site for Web page content that includes one or more terms included in an index of medical terms. The index can include any number of terms. In one embodiment, for example, this index includes approximately 20,000 predefined medical terms.  
20 If the agent 202 does not "hit" any of the terms at a particular site, the site is identified as a non-medical Website so that it is not later revisited by the agent 202.

Upon locating a Web resource, such as a HTML Web page the agent 202 downloads the resource to the context engine 204. The context engine  
25 204 scans the downloaded document to generate an ID code corresponding to the document. To accomplish this, the context engine 204 relies on a knowledge matrix 206.

The knowledge matrix 206 is a data structure organizing the index terms into a multi-dimensional hierarchical tree. Each node in the tree has an  
30 ID code associated with it. Individual index terms can be mapped to multiple nodes. For example, a medical index can include 20,000 terms, whereas the corresponding tree can include 35,000 nodes. Each node represents a term and its corresponding ID code. In addition, the knowledge matrix can store a

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short textual definition for each term as well as synonyms and cross-references to related parts of the hierarchy.

While scanning a document, the context engine **204** compares the content of the document to the knowledge matrix **206** to assign one or more index terms to the document. A predetermined set of sites or information resources have been reviewed and deemed to be trustworthy in the aggregate. If a document is determined to be from one of these trusted sites it is assigned an attribute indicating that it is credible medical content. The document may be further classified based on the type of information it portrays (image collection, clinical trial, etc.) or the type of information resource that it comes from (encyclopedia, drug database, professional manual etc.). In addition, for a predetermined set of topic areas the ID codes and the document itself are then provided to one or more medical professionals, such as physicians, for review (box 208). Review of the Web page content and the ID code by a qualified medical practitioner insures the accuracy and integrity of the medical information contained in the document, as well as the integrity of its classification within the system disclosed herein. For these specific topic areas documents that pass medical review are further subclassified and packaged together to provide complete, vetted packages of information on specific topic areas.

The Internet address of the document is inserted into the link database **74** (box **210**). By inserting the document's address and ID code into the database, the document is then made available to users of the system.

**FIG. 20** shows a flow chart diagram of a method **212** of classifying a document. The method can be employed by the context engine **204** to associate one or more ID codes with medical documents downloaded from networked resources.

In step **213**, a text document is received. Words in the document are stemmed and truncated. A document array is then created (step **215**). The array can be a plain array, where each element in the array represents a stemmed word in the document.

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The document array is then "scanned" using a sliding window. The sliding window defines a predetermined number of words. Starting at the beginning of the document array, the window sequentially moves across the 5 array on a per word basis, until reaching the end of the document. Each time the window is moved, words appearing in the window are applied to an associative array (step 217).

One or more associative arrays can be provided for correlating the ID codes in the knowledge matrix to key values. The key values can represent 10 truncated and stemmed terms included in the knowledge matrix. Each key value can be associated with a hash, which can be an ID code. Key values can include one or more words (terms). An associative array can be provided based on the number of terms appearing in the key values. For instance, an associative array can be provided for key values representing one word, while 15 a second associative array can be provided for key values having two words, and so on. If the words appearing in the sliding window match a key value of a particular associative array, a hash value (ID code) is returned.

Steps 216-217 can be repeated for various window sizes. Preferably, the document is first scanned using a sliding window having a size of one 20 word. The scanning procedure is then repeated for a sliding window having a size of two words. The steps 216 and 217 are then repeated until reaching a maximum window size. It will be apparent to one of ordinary skill in the art that the present invention is not limited to any particular maximum or minimum window size.

25 As a result of performing steps 216 and 217, one or more ID codes are generated for the document. The ID codes represent the classification of the document and can be stored in the link database 74, along with a generic identifier associated with the document.

**FIG. 21** shows a tree diagram 220 illustrating a two-dimensional 30 hierarchical index of terms that represents a simple example of a knowledge matrix. The tree 220 includes more general terms at its top, and moves to more specific terms in the lower level branches. In the example shown, the general term "anatomy" appears at the highest level, while the more specific terms "skeletal" and "muscle" appear in the second level. Below this level, the

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terms "arm" and "leg" appear below the term muscle. Each node in the tree also has a hierarchically-indexed alphanumeric ID code associated with it. As shown, the term "anatomy" has the ID code "AO" associated with it; the second-level terms "skeletal," "muscle," and "digestive" have the ID codes 5 "AO-B1," "AO-B2," and "AO-B3" associated therewith, respectively; and the third-level terms "arm" and "leg" have associated the ID codes "AO-B2-C1" and "AO-B2-C2," respectively. The tree 220 is just one illustration of a hierarchical tree for organizing medical terms. Trees having more than two dimensions can be used by the knowledge matrix; also, terms in the index can 10 be cross linked within the tree.

FIG. 22 shows a flow chart diagram of a method 240 of performing a natural language search. In step 242, a search query is received by the search engine 110. The search engine 110 can perform a spell check on the query (step 244). In performing the spell check, the search engine 110 can 15 display alternative spelling for one or more terms included in the query. A user can then select the correct term and continue the query operation.

In step 246, the search engine 110 parses the query to remove common words that are not relevant to the search. Words typically include articles such as "a" and "the," as well as connectors and prepositions, such as 20 "to," "for," "as," "and," etc. In step 248, the search engine 110 reduces the remaining terms to singular form and stem form. This is done by truncating plural forms and gerund forms of terms.

In step 250, the preprocessed terms are then compared to individual terms included in the index of medical terms of the knowledge matrix. In 25 addition to comparing individual terms, the search engine 110 can compare word-pairs to the index terms (step 252). In this manner, ID codes can be associated with the query.

As a result of the comparison to the index terms, the search engine 110 displays a question set (step 254). An example of a question set 30 displayable by the search engine 110 is shown in FIG. 23. The question set permits the user to refine the search even further. The particular question displayed in the set are based on the contextual relevance of the initial query. The contextual relevance is determined by comparing the terms of the search to the structure and terms of the knowledge matrix. For example, ancillary

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keywords included in the query, such as "treatment," "therapy," clinical trials," or the like, can be used to posit questions related thereto.

**FIG. 23** shows a page **260** displaying the results of an exemplary natural language search. The page **260** can be displayed by the browsers **66**.

- 5 The query itself, "how do you get lyme disease" is displayed in the query window **262**. The query can be limited to one or more user-selectable categories **264**. The categories illustrated in the example include "diseases," "mental health," "therapy and procedure," "anatomy," "drugs and chemicals," and "organisms." In addition, the user can select whether or not the spell
- 10 checking function is performed on the query by selecting the check spelling box **266**.

As a result of the query, the search engine produces a set of questions **268**. Each question in the set **268** includes a pull-down menu **270** of indexed terms that are either included in the query or related to the query. Each  
15 question also includes a find button **272** permitting the user to select the question.

The question set **268** allows a user to further refine the search before displaying the results. This two-level approach to searching for medical information greatly enhances a user's ability to quickly and conveniently  
20 locate sought-after information. The final result of the two-level natural language search of **FIG. 23** is illustrated in **FIG. 25**. The final result was generated by selecting the "images and illustration of Lyme Disease" question from the set of questions **268**.

**FIG. 24** shows a flow chart diagram illustrating a method **300** of displaying medical product information at remote computers such as on a Web page presented at the browsers **66**. The displayed medical product information is selected to be contextually relevant to the medical information retrieved by the member and also displayed on the page. An example of a page displaying medical information and contextually relevant product  
30 information is shown in **FIG. 25**.

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Turning now to the method 300, in step 302 a displayable product advertisement and/or e-commerce service is assigned a hierarchical index ID code from the knowledge matrix. The e-commerce service may be contextual commerce service, product opportunity and/or solution. The ID code can be  
5 assigned by trained personnel familiar with the product and the ID codes of the knowledge matrix. Alternatively, the context engine 204 can be used to classify the advertisement and/or e-commerce service. The assigned ID code can be a measure of the specificity of the medical information contained in the advertisement and/or e-commerce service. The specificity of the information  
10 is the level of detail and/or focus on a specific subject.

As discussed earlier herein, a hierarchical index ID code is assigned to Web page links to medical information at various public sites (step 304). The system monitors member access to various links and medical information (step 306). When a member selects a particular link, the system displays  
15 product information having a corresponding hierarchical index ID code (step 308). In this manner, product information relevant to the medical information being sought is displayed. As the specificity of the medical information increases, the specificity of the medical product can likewise increase. Accordingly, for a member selecting very specific medical  
20 information, such as medical journal articles on treating lyme disease, only product information relevant to that specific medical information is displayed.

**FIG. 25** illustrates an exemplary Web page 350 displayed by the system for presenting medical product information and medical links in a contextually-related manner. The ads 354 or e-commerce service item 355,  
25 can include images, videos, text, audio, or any other media type supported by the WWW. The e-commerce service items may include any contextual service, opportunity, product, and/or solution. Also, the ads 354 or e-commerce service item can include hyperlinks to vendor Websites.

With respect to the e-commerce service items 355, the vendor  
30 Websites can include conventional e-commerce software permitting members to directly purchase the advertised product online. Alternatively, the e-commerce service items 355, can include links to e-commerce engines or shopping carts that permit immediate shopping check out. In this arrangement, the link could call a CGI program or any other resource for

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automatically submitting an order to an online vendor. Purchaser information, such as name, mailing address, and credit card number could be obtained from the member database 76, and submitted to the online vendor along with product information associated with the link and quantity information entered

- 5 by the member using a displayable form.

- The page 350 includes one or more links 352 to networked resources containing the desired information. Also displayed on the page 350 are ads 354 and e-commerce service item 355 for products or other e-commerce services, solutions or opportunities that are contextually related to the links
- 10 352. The page 350 also displays indexed terms 357 included in the knowledge matrix. The terms 357 are displayed in their hierarchical order, from most general to most specific. A definitions button 358 is also displayed on the page 350. The definitions button 358 permits a member to selectively display the definitions associated with each of the terms 357 included in the
- 15 list 356.

- If there are more relevant ads or e-commerce service items stored at the site 62 than can be reasonably displayed on a Web page, then a limited number of the contextually relevant ads are displayed in response to the member link selection. The e-commerce service items or ads that are
- 20 displayed can be randomly selected. Alternatively, the ads or e-commerce service items can be weighted based on a paid fee so that they appear at member browsers more frequently than other similarly relevant ads.

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While specific embodiments of the present invention have been shown and described, it will be apparent to those skilled in the art that the disclosed invention may be modified in numerous ways and may assume many 5 embodiments other than those specifically set out and described above. Accordingly, the scope of the invention is indicated in the appended claims, and all changes that come within the meaning and range of equivalents are intended to be embraced therein.

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## I CLAIM:

1. A system, comprising:  
a database for storing a plurality of locations of networked  
resources having content that includes medical information, each of the stored  
locations being associated with a hierarchically-indexed identification code;  
and  
a user interface, operatively coupled to the database, for  
allowing a user to selectively retrieve at least one of the locations based on  
the hierarchically-indexed identification code.
2. The system of claim 1, further comprising:  
a communication server, operatively coupled to the user  
interface, for permitting the user to access the user interface by way of a  
computer network.
3. The system of claim 1, further comprising:  
an agent for locating the networked resources by determining  
the Internet address of each of the networked resources.
4. The system of claim 3, wherein the agent includes means for  
comparing the content of each of the networked resources to a predetermined  
index of medical terms.
5. The system of claim 1, further comprising:  
a context engine for indexing the content of each of the  
networked resources to generate the hierarchically-indexed identification  
code.
6. The system of claim 1, further comprising a plurality of user  
spaces, each of the user spaces including at least one folder having  
predetermined access privileges.

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7. The system of claim 6, further comprising:  
means for permitting a user to store the at least one of the  
5 locations in the at least one folder.

8. A system for providing medical information to at least one user,  
comprising:  
a content gathering subsystem that locates a plurality of  
10 networked resources having content that includes medical information;  
a context engine for indexing the content of the networked  
resources to generate a plurality of index records;  
a database for storing the locations of the networked resources  
and the index records; and  
15 a user interface allowing the at least one user to selectively  
access the medical information by searching the database.

9. The system of claim 8, further comprising means for permitting  
the at least one user to access the networked resources.  
20

10. The system of claim 8, wherein the networked resources include  
a web page containing medical information.

11. The system of claim 8, wherein the medical information includes  
25 information selected from the group consisting of medical procedures,  
treatments, therapies, disease information, general background information  
and diagnostic information.

12. The system of claim 8, further comprising a search engine for  
30 retrieving at least one of the locations of the networked resources in response  
to a query from the at least one user.

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13. The system of claim 12, wherein the search engine is capable of performing a search selected from the group consisting of a keyword search, a natural language search, a hierarchical index search, and an alphabetical index search.

14. The system of claim 8, further comprising an online registration subsystem for regulating user access to the system.

10 15. The system of claim 8, further comprising a plurality of user spaces, each of the user spaces having one or more folders having limited access.

15 16. The system of claim 15, wherein the folders contain at least one pointer referencing at least one of the locations stored in the database.

17. The system of claim 15, wherein the user spaces include at least one physician user space.

20 18. The system of claim 18, wherein the at least one physician user space is initialized with at least one predetermined folder based on a physician specialty.

25 19. The system of claim 8, wherein the content gathering subsystem includes an agent for accessing ones of the networked resources located on the World Wide Web.

30 20. The system of claim 19, wherein the agent compares the content of the ones of the networked resources to a predetermined index to determine whether the content includes medical information.

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21. The system of claim 1, wherein the content gathering subsystem includes means for permitting a healthcare professional to review the content that includes medical information.

5

22. A method for providing medical information to at least one user by way of a computer network, comprising:

locating a plurality of networked resources having content that includes medical information;

10 indexing the content of the networked resources to generate a plurality of index records;

storing the locations of the networked resources and the index records; and

15 providing an interface for allowing the at least one user to selectively access the medical information by searching the database.

23. The method of claim 22, further comprising:

providing a plurality of user spaces having one or more folders having limited access, each folder for containing at least one pointer referencing the database.

20

24. The method of claim 22, further comprising:

comparing the content of the networked resource to a predetermined index of terms to determine whether the content includes medical information.

25

25. A system, comprising:

means for storing a plurality of locations of networked resources having content that includes medical information, each of the stored locations being associated with a hierarchically-indexed identification code; and

30

means for allowing a user to selectively retrieve at least one of the locations based on the hierarchically-indexed identification code.

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26. A method of providing information related to a medical affliction to a patient, comprising:

- 5       providing an electronic folder accessible by the patient using a computer;
- 10      providing a database storing a plurality of addresses identifying a plurality of networked resources having medical information;
- 15      providing a database interface that permits a physician to select at least one of the networked resources having information related to the medical affliction; and
- 20      storing at least one of the addresses identifying the at least one of the networked resources in the electronic folder so that the patient can access the at least one networked resource to obtain the information related to the medical affliction.

15

27. The method of claim 26, further comprising:

- 20      receiving, over a computer network, a request for medical advice from the patient; and
- 25      forwarding the request to the physician by way of the computer network.

28. The method of claim 26, further comprising:

- 25      providing a patient interface that permits the patient to select, using a computer, the physician from a list of available physicians.
- 30      29. The method of claim 26, further comprising:
- 35      registering the patient by way of a computer network to establish the electronic folder.
- 40      30. The method of claim 26, further comprising:
- 45      providing a user ID and password to the patient for accessing the electronic folder.

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31. A method of providing a patient with information regarding a medical condition, comprising:
  - establishing a folder for the patient;
  - 5 registering the patient so that the patient can access the folder using a computer;
  - receiving, over a computer network, a request from the patient for medical advice regarding the medical condition;
  - forwarding the request to a medical professional using a
  - 10 computer network;
  - providing a database identifying a plurality of networked resources having medical information;
  - providing a database interface that permits the medical professional to select at least one of the networked resources having the
  - 15 information regarding the medical condition; and
  - storing information pertaining to the at least one of the networked resources in the folder so as to permit the patient to access the at least one of the networked resources to obtain the information regarding the medical condition.
- 20
32. The method of claim 31, further comprising:
  - providing a user ID and password to the patient for accessing the folder.

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33. The method of claim 31, further comprising:  
selecting the medical professional based on medical specialty.
  
- 5        34. The method of claim 31, further comprising:  
selecting the medical professional based on a physician  
selection of the patient.
  
- 10        35. The method of claim 31, further comprising:  
selecting the medical professional based on a look-up table  
identifying predetermined patient-physician relationships.
  
- 15        36. The method of claim 31, further comprising:  
storing comments of the medical professional in the folders.
  
- 20        37. The method of claim 31, wherein the address is a uniform  
resource identifier (URI).
  
- 25        38. A system for providing medical information to a patient,  
comprising:  
a computer folder for the patient;  
a communication server for permitting the patient to access the  
computer folder using a network;  
a database for storing a plurality of addresses identifying a  
plurality of networked resources having medical information;  
an interface, operatively associated with the database, for  
allowing a medical professional to select at least one of the networked  
resources having medical information relevant to the patient; and  
an application server configured to store at least one address of  
the at least one networked resource in the computer folder.
  
- 30

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39. The system of claim 38, further comprising:  
an application program configured to receive patient requests for  
medical information over a network.

5

40. The system of claim 38, wherein the application server is  
configured to store comments of the medical professional in the computer  
folder.

10 41. The system of claim 38, wherein the at least one address is a  
uniform resource identifier (URI).

42. The system of claim 38, further comprising an application  
program for registering the patients.

15

43. The system of claim 38, further comprising a look-up table for  
associating the patient with the medical professional.

20 44. A method of presenting a contextually relevant e-commerce  
services at a remote computer display, comprising:

transferring to the remote computer display a link to a networked  
resource, the link being associated with a hierarchically-indexed identification  
code and displayable by the computer display; and

25 item corresponding to the hierarchically-indexed identification code and  
displayable by the remote computer display.

45. The method of claim 44, further comprising:  
including the link and the e-commerce service item in at least  
30 one web page.

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46. The method of claim 44, further comprising:  
assigning the hierarchically-indexed code to the e-commerce  
service item based on the content of the e-commerce service.

5

47. A method of presenting a contextually relevant advertisement at  
a remote computer display, comprising:

transferring to the remote computer display a link to a networked  
resource having information of a predetermined specificity; and

10 transferring to the remote computer display e-commerce service  
item corresponding to the predetermined specificity so that the link and the  
e-commerce service items are presented to a user at the remote computer  
display in a contextually-related manner.

15

48. The method of claim 47, further comprising:  
including the link and the e-commerce item in a web page.

49. The method of claim 47, wherein the e-commerce service item  
is an image.

20

50. The method of claim 47, wherein the e-commerce service item  
includes a hyperlink to a vendor web page.

51. A computer-readable media storing a program for directing a  
25 computing device to transfer to a remote computer display a link to a  
networked resource, the link being associated with a hierarchically-indexed  
identification code and displayable by the computer display, and to transfer to  
the remote computer display an e-commerce service corresponding to the  
hierarchically-indexed identification code and displayable by the remote  
30 computer display.

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52. A system for presenting a contextually relevant e-commerce service at a remote computer display, comprising:

- 5 a communication server, connected to a communication network, for receiving a request from a user at a remote computer; and
- 10 an application server, operatively coupled to the communication server, configured to transfer to the remote computer, in response to the request, a link to a networked resource having information of a predetermined specificity and to transfer to the remote computer an e-commerce service corresponding to the predetermined specificity so that the link and the e-commerce service are presented to the user at the remote computer in a contextually-related manner.

53. A system for presenting a contextually relevant e-commerce service at a remote computer display, comprising:

- 15 means for receiving a request from a user at a remote computer; and
- 20 means for transferring, in response to the request, to the remote computer a link to a networked resource having information of a predetermined specificity and to transfer to the remote computer an e-commerce service corresponding to the predetermined specificity so that the link and the e-commerce services are presented to the user at the remote computer in a contextually-related manner.

25 54. A method of presenting a contextually relevant advertisement at a remote computer display, comprising:

- 30 transferring to the remote computer display a link to a networked resource, the link being associated with a hierarchically-indexed identification code and displayable by the computer display; and
- 35 transferring to the remote computer display an advertisement corresponding to the hierarchically-indexed identification code and displayable by the remote computer display.

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55. The method of claim 54, further comprising:  
including the link and the advertisement in at least one web  
page.

5

56. The method of claim 54, further comprising:  
assigning the hierarchically-indexed code to the advertisement  
based on the content of the advertisement.

10 57. A method of presenting a contextually relevant advertisement at  
a remote computer display, comprising:

transferring to the remote computer display a link to a networked  
resource having information of a predetermined specificity; and  
transferring to the remote computer display an advertisement  
15 corresponding to the predetermined specificity so that the link and the  
advertisement are presented to a user at the remote computer display in a  
contextually-related manner.

20 58. The method of claim 57, further comprising:  
including the link and the advertisement in a web page.

59. The method of claim 57, wherein the advertisement is an image.

25 60. The method of claim 57, wherein the advertisement includes a  
hyperlink to a vendor web page.

30 61. A computer-readable media storing a program for directing a  
computing device to transfer to a remote computer display a link to a  
networked resource, the link being associated with a hierarchically-indexed  
identification code and displayable by the computer display, and to transfer to  
the remote computer display an advertisement corresponding to the  
hierarchically-indexed identification code and displayable by the remote  
computer display.

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62. A system for presenting a contextually relevant advertisement at a remote computer display, comprising:

- a communication server, connected to a communication network, for receiving a request from a user at a remote computer; and
- an application server, operatively coupled to the communication server, configured to transfer to the remote computer, in response to the request, a link to a networked resource having information of a predetermined specificity and to transfer to the remote computer an advertisement corresponding to the predetermined specificity so that the link and the advertisement are presented to the user at the remote computer in a contextually-related manner.

63. A system for presenting a contextually relevant advertisement at a remote computer display, comprising:

- means for receiving a request from a user at a remote computer;
- and
- means for transferring, in response to the request, to the remote computer a link to a networked resource having information of a predetermined specificity and to transfer to the remote computer an advertisement corresponding to the predetermined specificity so that the link and the advertisement are presented to the user at the remote computer in a contextually-related manner.

25       64. A method of sharing information stored in a member folder maintained at a networked server, comprising:

- receiving a member request to share the information with a recipient member;
- determining whether the recipient member has authorized information sharing;
- if so, providing the information to the recipient member; and
- if not, notifying the recipient member of the member request.

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65. The method of claim 64, further comprising:  
accessing an authorization table to determine whether the  
recipient member has authorized information sharing.

5

66. The method of claim 64, wherein the member request identifies  
the recipient member.

67. The method of claim 64, wherein the member request identifies  
10 access privileges to be granted to the recipient member.

68. A system for accessing information through a publicly accessible  
web site, the web site including a plurality of user folders for storing  
information, each of the folders having access privileges, comprising:  
15 a communication server that permits a plurality of users at a  
plurality of browsers to access the folders; and  
an application server, operatively coupled to the communication  
server, that provides a user interface displayable at the browsers for  
permitting the users to selectively set the access privileges of respective ones  
20 of the folders.

25

69. The system of claim 68, further comprising:  
a database, operatively associated with the application server,  
for storing user information.

70. The system of claim 69, wherein the database stores access  
privilege information for each of the users.

30

71. The system of claim 68, further comprising:  
an authorization table, operatively associated with the  
application server, for determining whether at least one of the users accepts  
access privileges granted by another of the users.

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72. The system of claim 68, wherein the access privileges include access privileges granted to at least one other of the users.

5 73. The system of claim 68, wherein the access privileges are selected from the group consisting of read access and write access.

74. The system of claim 73, wherein the user interface includes a first web page for displaying the names of one or more of the user folders  
10 associated with at least one hyperlink for granting access privileges to at least one other of the users.

75. A method of classifying a document, comprising:  
downloading the document from a networked resource;  
15 scanning the document using a variable-sized sliding window to select at least one word included in the document;  
applying the at least one word to a predetermined associative array to generate a hash value; and  
associating the hash value with the document.

20 76. The method of claim 75, further comprising:  
stemming the at least one word prior to scanning the document.

77. The method of claim 75, further comprising:  
25 truncating the at least one word prior to scanning the document.

78. The method of claim 75, further comprising:  
sequentially scanning words in the document, using the  
variable-sized sliding window, from the beginning of the document to the end  
30 of the document.

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79. The method of claim 75, further comprising:  
representing the document as an array having a plurality of  
elements, wherein each of the elements represents a word in the document.

5

80. The method of claim 75, further comprising:  
increasing the size of the variable-sized sliding window; and  
re-scanning the document with the increased variable-sized  
sliding window.

10

81. The method of claim 80, further comprising:  
providing a plurality of associative arrays, each of the  
associative arrays corresponding to a respective size of the variable-sized  
sliding window.

15

82. The method of claim 75, further comprising:  
storing the hash value in a database.

83. A computer-readable medium storing a program for directing a  
computing device to classify a document by performing the following steps:  
downloading the document from a networked resource;  
scanning the document using a variable-sized sliding window to  
select at least one word included in the document;  
applying the at least one word to a predetermined associative  
array to generate a hash value; and  
associating the hash value with the document.

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84. The computer-readable medium of claim 83, wherein the steps further include:

stemming the at least one word prior to scanning the document.

5

85. The computer-readable media of claim 83, wherein the steps further include:

truncating the at least one word prior to scanning the document.

10 86. The computer-readable media of claim 83, wherein the steps further include:

sequentially scanning words in the document, using the variable-sized sliding window, from the beginning of the document to the end of the document.

15

87. The computer-readable medium of claim 83, wherein the steps further include:

representing the document as an array having a plurality of elements, wherein each of the elements represents a word in the document.

20

88. The computer-readable medium of claim 83, wherein the steps further include:

increasing the size of the variable-sized sliding window; and re-scanning the document with the increased variable-sized  
25 sliding window.

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89. The computer-readable medium of claim 88, wherein the steps further include:

- providing a plurality of associative arrays, each of the  
5 associative arrays corresponding to a respective size of the variable-sized sliding window.

90. The computer-readable medium of claim 83, wherein the steps further include:

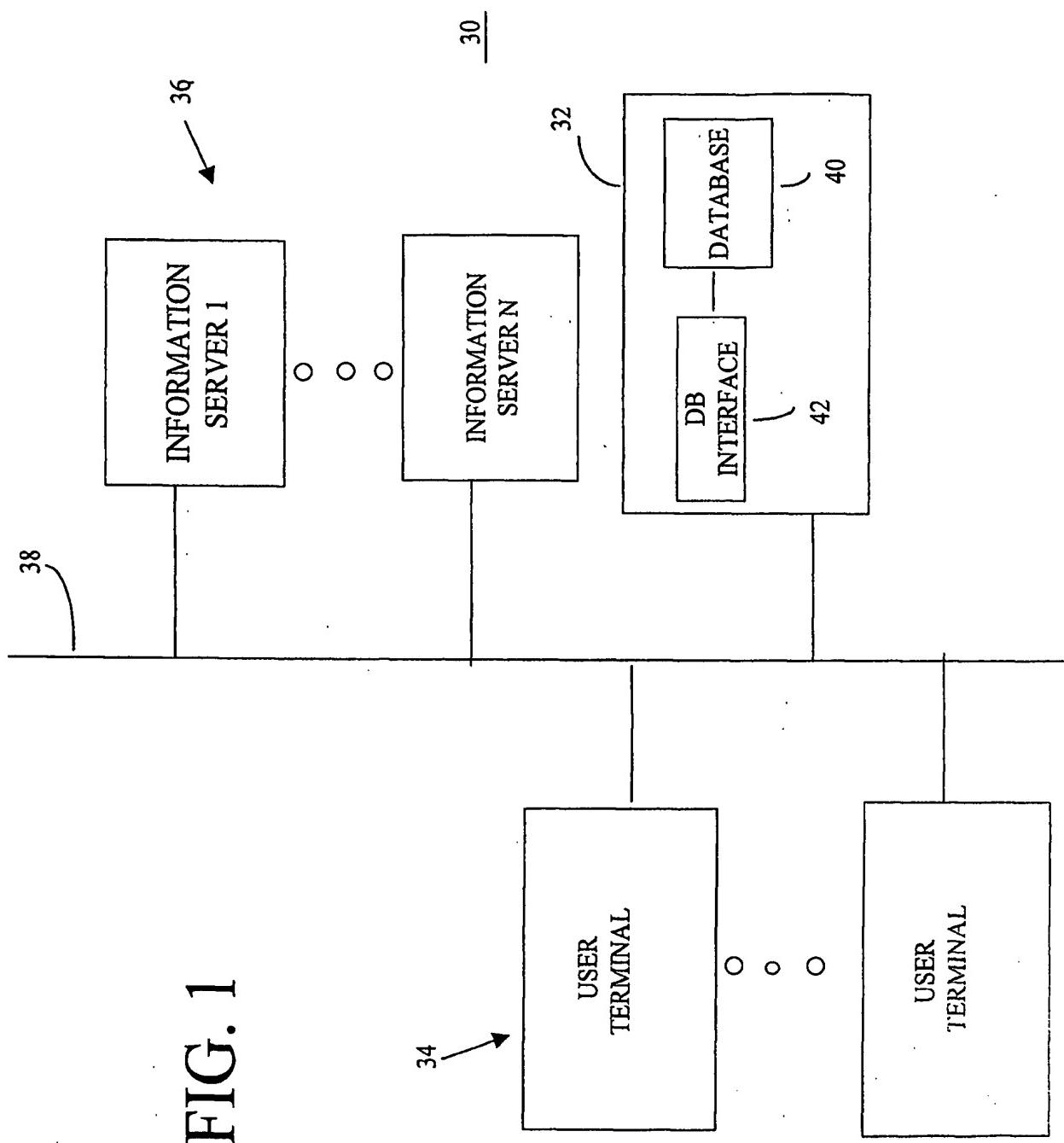
- 10 storing the hash value in a database.

91. An apparatus for classifying a document, comprising:  
a server configured to download the document from a networked resource; and  
15 a context engine that scans the document using a variable-sized sliding window to select at least one word included in the document, the context engine also applying the at least one word to a predetermined associative array to generate a hash value and associating the hash value with the document.

20

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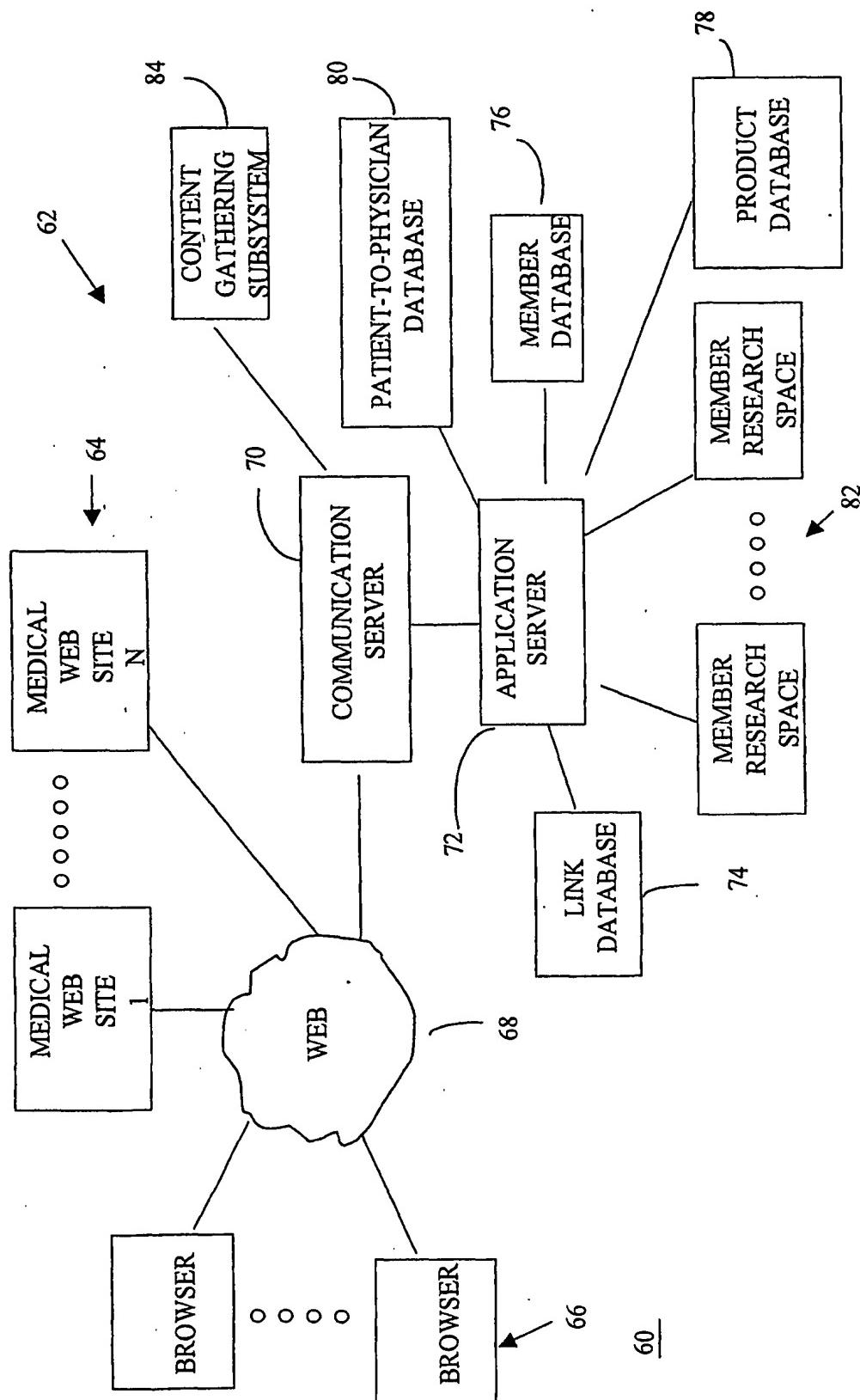


FIG 2

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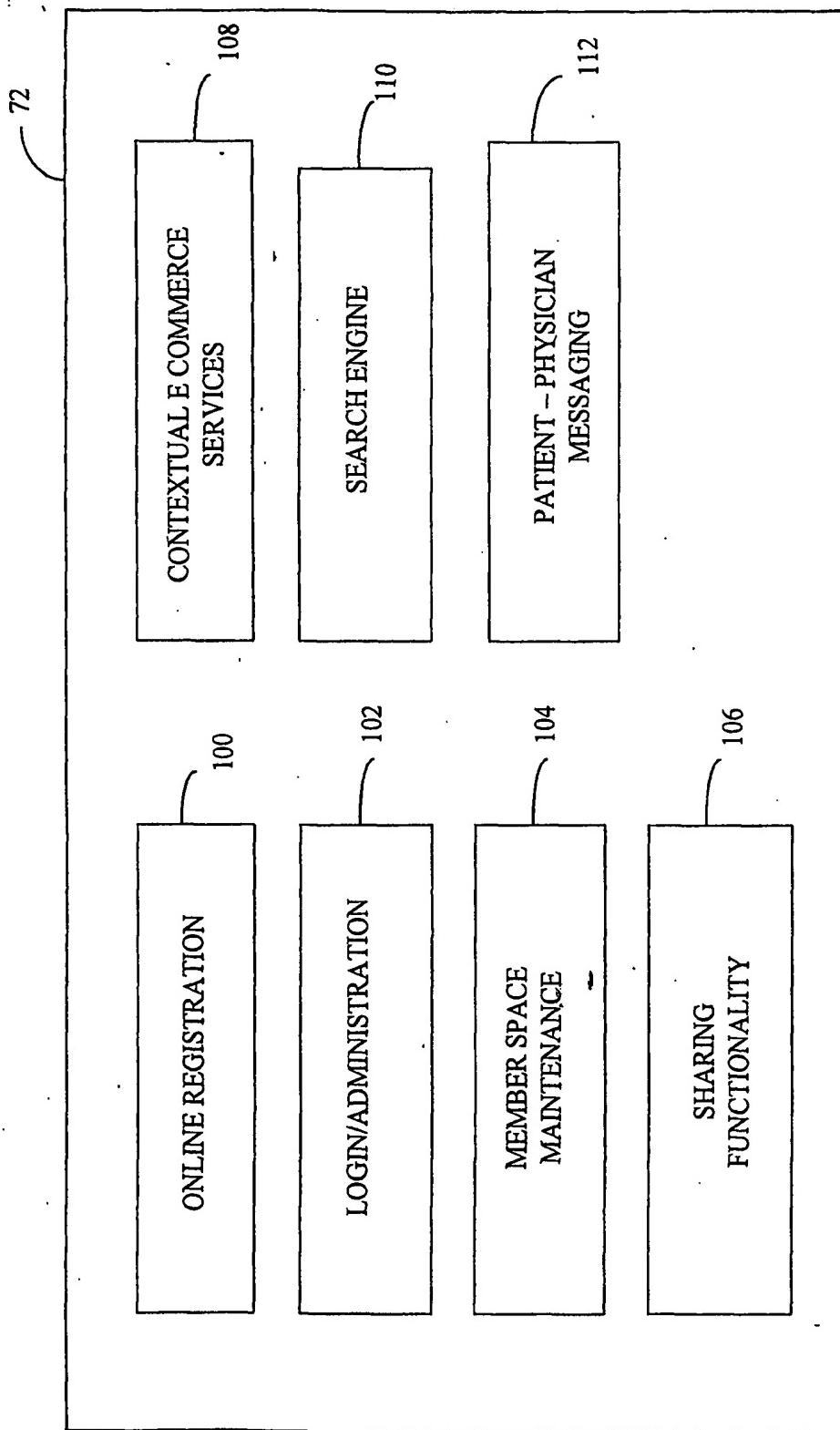


FIG. 3

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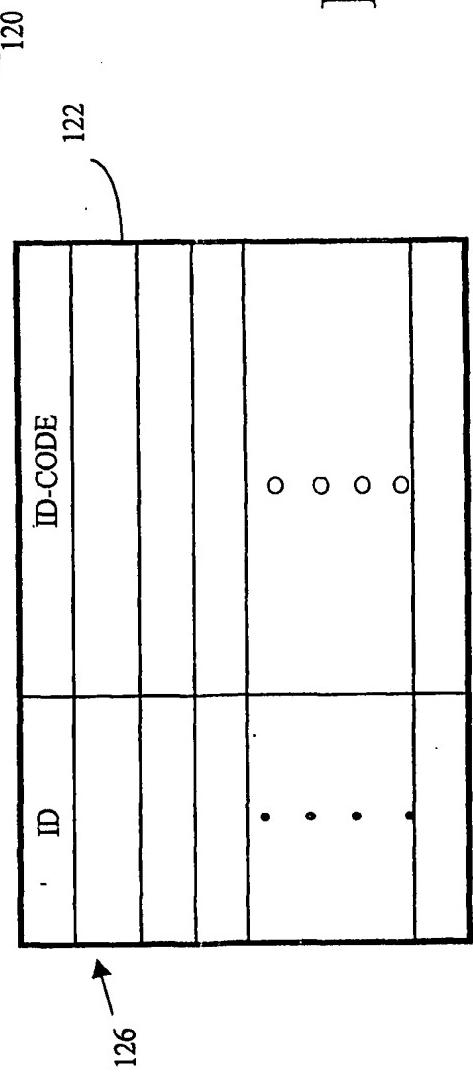


FIG. 4

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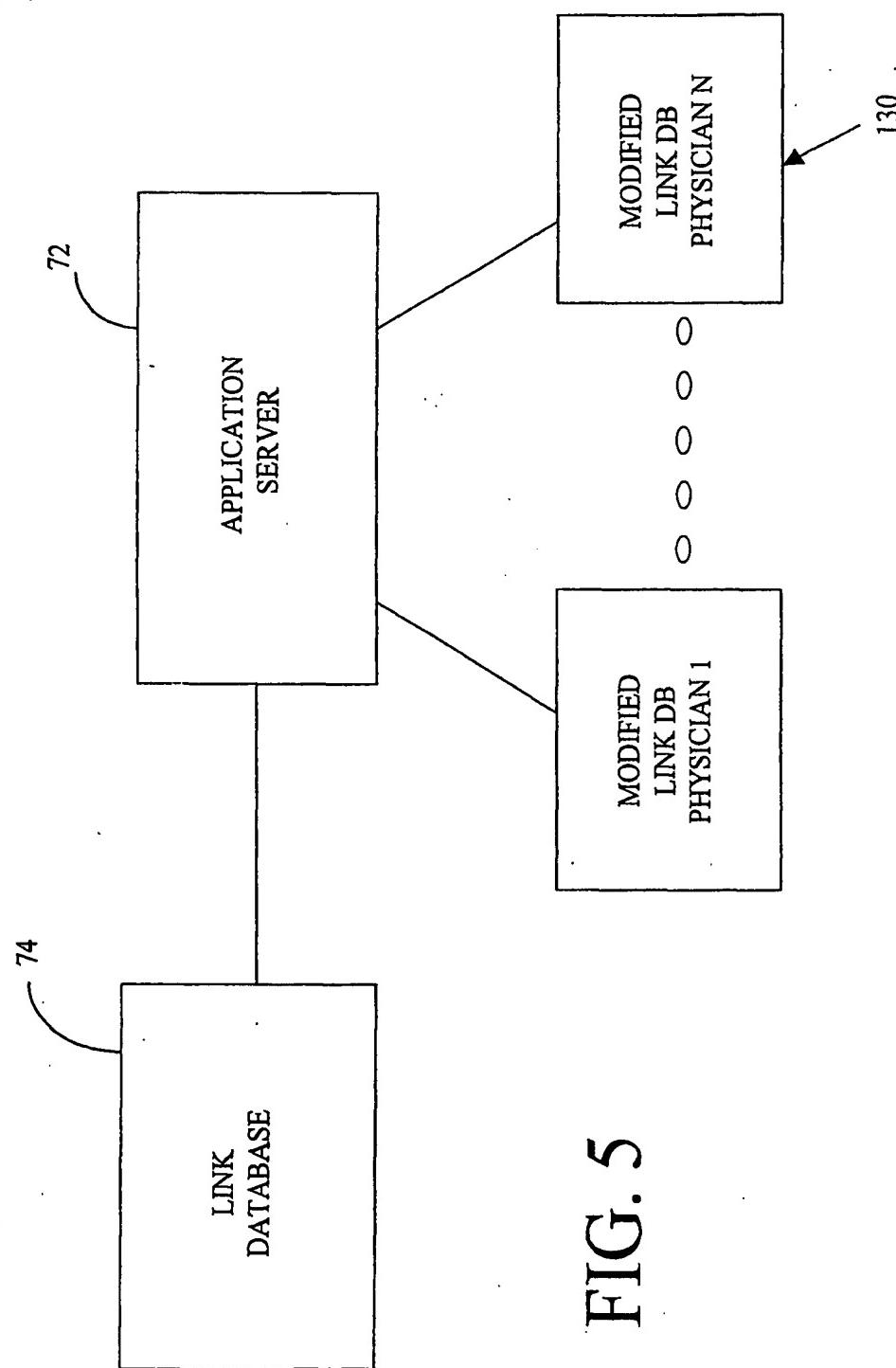
129

FIG. 5

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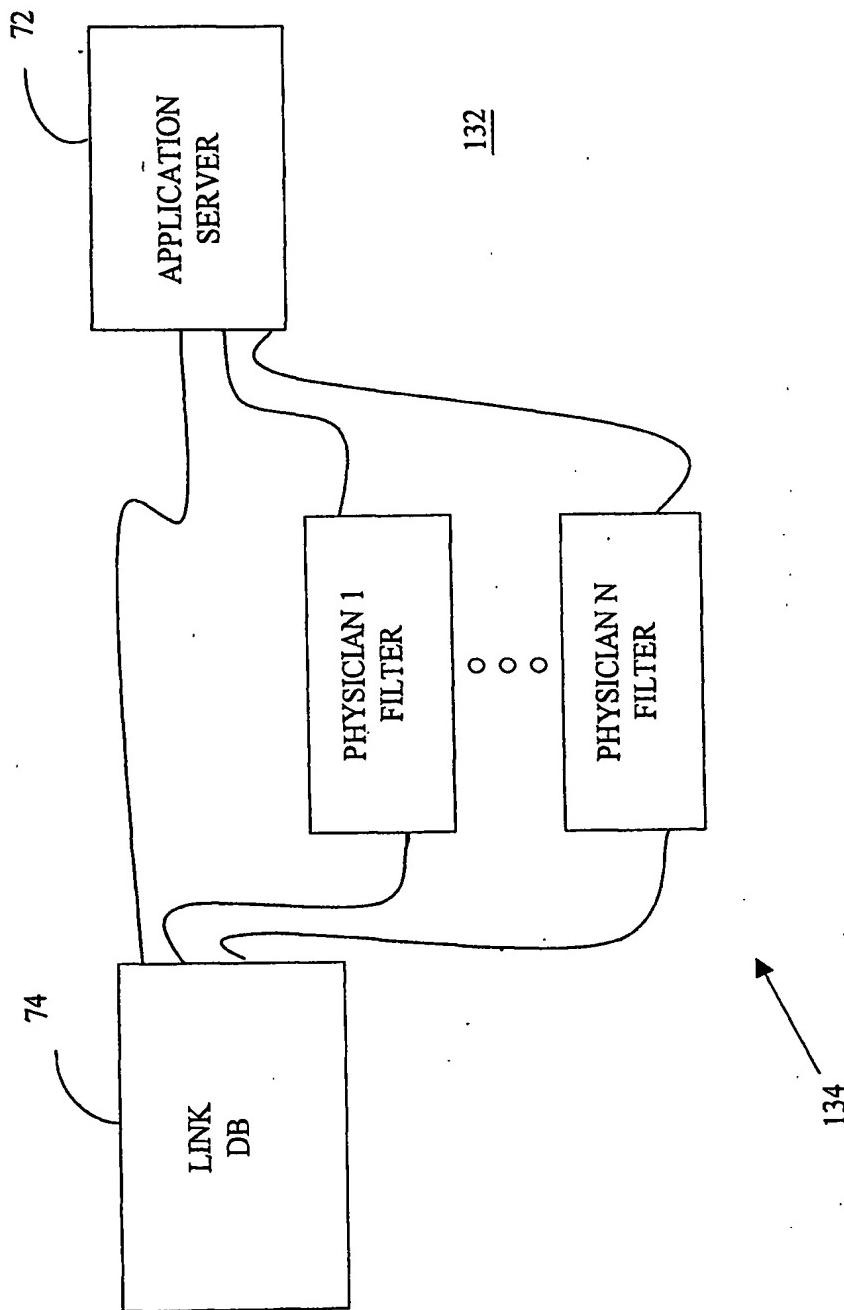


FIG. 6

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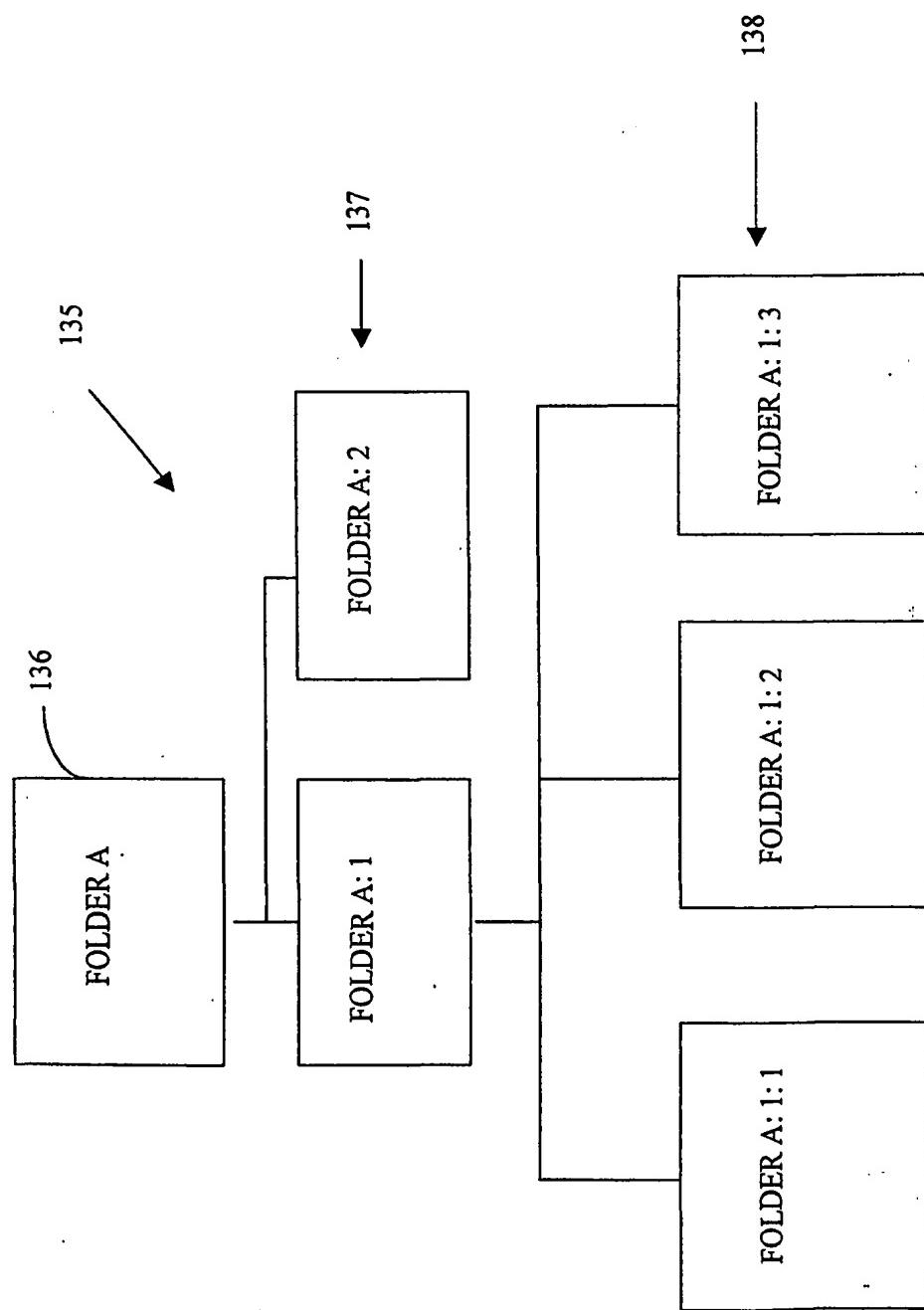
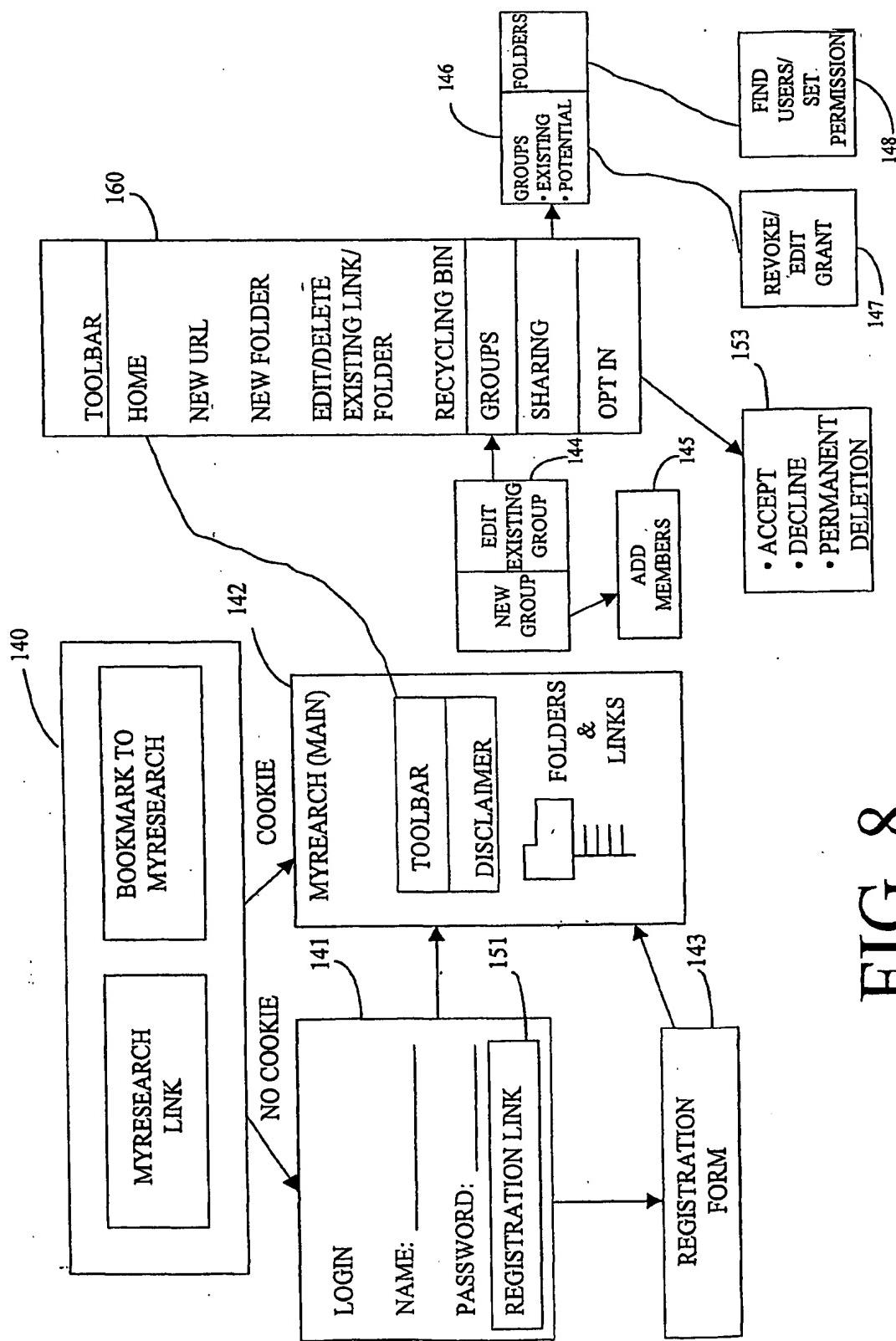


FIG. 7

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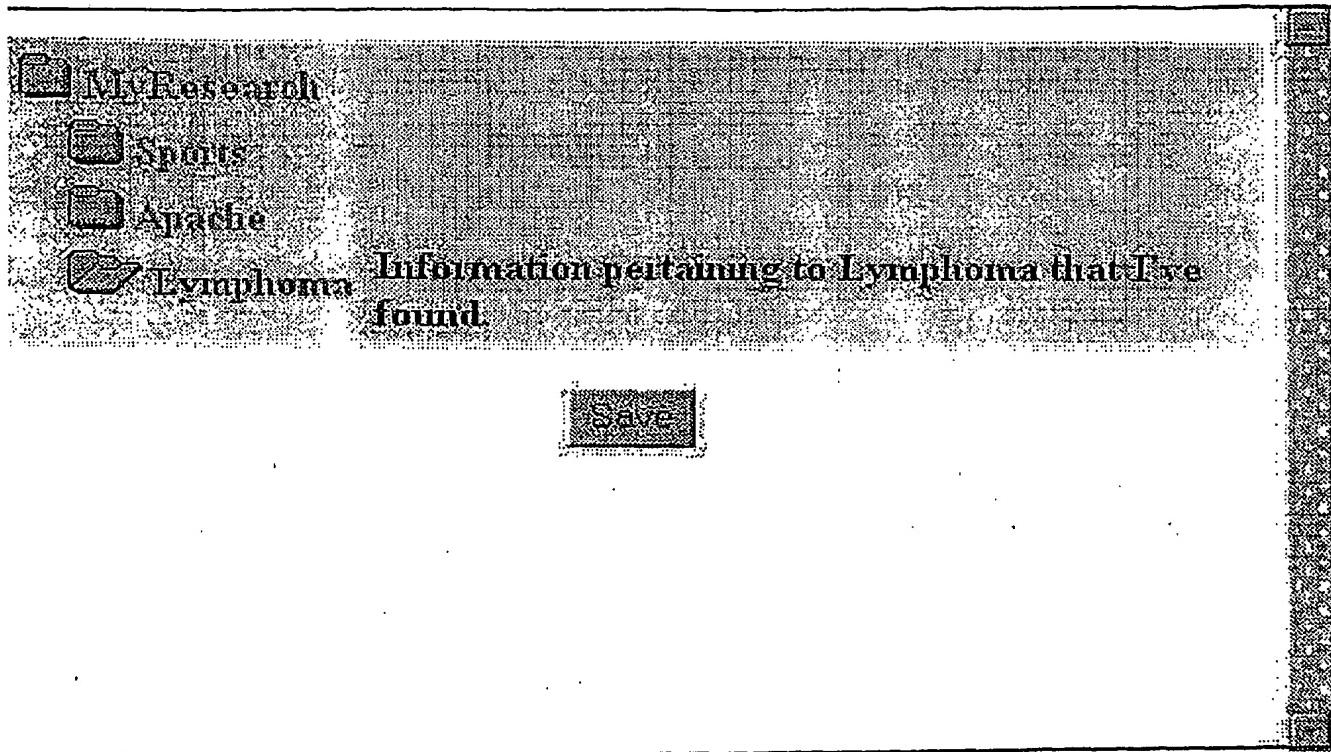
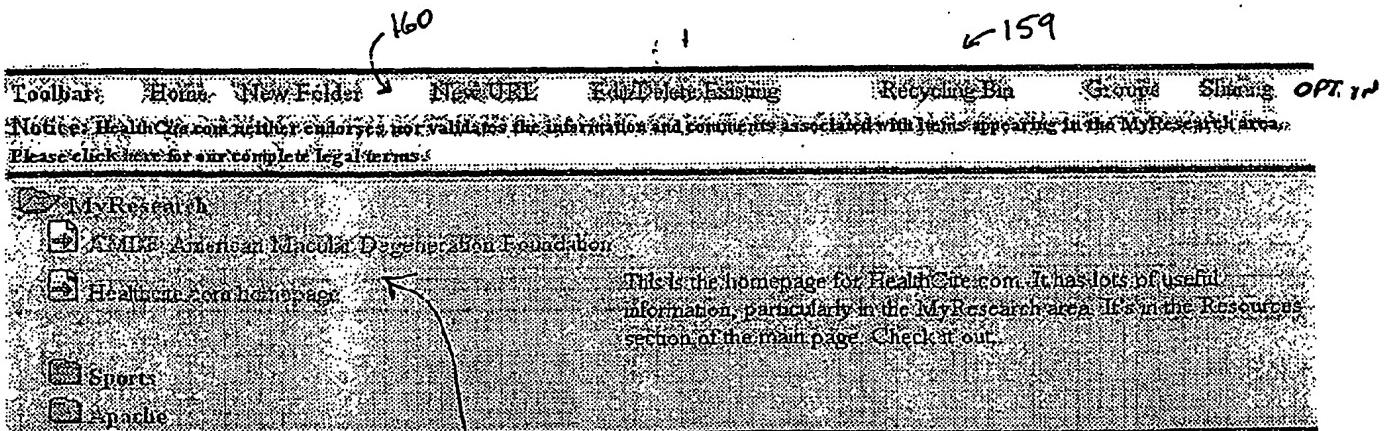


8  
FIG.

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**FIG. 9****FIG. 10**

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This form will allow you to add a sub-folder to your list of MyResearch items. Just complete it and click on the Submit button.

Folder Name: Lymphoma

Optional Comments: Information pertaining to Lymphoma that I've found.

**FIG. 11**

164

This form will allow you to add a new link to your list of MyResearch items. Just complete it and click on the Submit button.

URL: <http://www.healthline.com>

How would you like this to appear in MyResearch? If you leave this item blank the page's default title will be used.

Link Name: Healthline.com homepage

Optional Comment: This is the Homepage for Healthline.com. There's lots of useful information here, particularly if you use the MyResearch Facility to the Resources section. Check it out.

**FIG. 12**

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This screenshot shows two pages from a web application:

- Group Sharing:** This page lists shares for groups. It includes a note about revoking shares and a table of shares. One share is highlighted with a red box and labeled "166".
- My Research Folder Sharing:** This page lists shares for My Research folders. It includes a note about creating shares and a table of shares. One share is highlighted with a red box and labeled "167".

The browser's toolbar at the top includes: Toolbar, Home, New Note, New URL, Edit/Delete Existing, Recycling Bin, Groups, Sharing, OPT IN.

The status bar at the bottom of the browser window shows "168" and "169".

FIG. 13

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**Toolbar:** Home New Folder ~~File~~ ~~Print~~ ~~Save~~ ~~Delete~~ Existing ~~Recycling Bin~~ Groups Sharing OPT IN

This page enables you to create groups for use in sharing your MyResearch items, and to manage existing groups that you have created yourself or that you have been granted access to by someone else.

**Create a New Group**

Group Name:

Group Description:

**Create Group**

**Editable or Viewable Groups**

No groups yet.

**FIG. 14**

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160 ↙

**Toolbar:** Home New Folder ~~File~~ ~~Print~~ ~~Save~~ ~~Delete~~ Existing ~~Recycling Bin~~ Groups Sharing OPT IN

This form allows you to update groups which you have created or to which you have been given editorial privileges.

For the **Group Name** and **Group Description** fields, simply make your changes in the text boxes and then click the **Submit** button. You will then return to the Group Management page, which will reflect your changes.

If you would like to remove a HealthCare.com user from the group, click on the **[remove]** button next to their name. Note that you can not remove the owner of the group.

To add new HealthCare.com users to this group, please use the form at the bottom of the page.

**Group Name:** Friends

**Optional Group Description:** Co-workers, friends, etc.

**Submit**

**Current Members:** GROUP OWNER: Sheridan-Peters, James (jrsp)  
Counsel, Keith (keith)

174 ↗ ↘ 175

**Add Members**

If you would like to add users to Friends, you can do so here. Just enter the beginning of their last name or username, click the appropriate button underneath the search box, and hit the **Search** button.

**Search String:**  > 175

**Search Type:**  By Last Name  By User Name

**Search**

↖ 173

**FIG. 15**

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This form allows you to share your groups with other HealthCare.com users.

Once you have finished setting up this group share, please click the Done button to make the share final.

If you want to abandon any changes you may have made, return to Sharing before clicking Done. There you will see any new shares you have made and be able to revoke shares which you no longer wish to keep.

You may change the permissions of existing shares, but if you change to whom you are sharing this Group a new share will be created, and you will have to delete the original share from Sharing.

**Group being shared:** Friends

**Group Description:** Co-workers, friends, etc.

Please use the short form below to set up this share of Group Friends.

To whom would you like to grant access? Enter the first few characters of a user's last name, or user name, or of a Group's name, click the appropriate button underneath the search box to indicate what kind of search you are performing, and hit the Search button.

Search String:

keith

Search Type:

By Last Name     By User Name     By Group Name

**Search**

McConnell, Keith (dcath)

What permissions should be granted on  
Friends?

Read     Write

**FIG. 16**

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This form allows you to share your MyResearch folders with other HealthLife.com users.

Once you have finished setting up this folder share, please click the Done button to make the share final.

If you wish to abandon any changes you may have made, return to Sharing before clicking Done. There you will see any new shares you have made and be able to revoke shares which you no longer wish to keep.

You may change the permissions of existing shares, but if you change to whom you are sharing this folder, a new share will be created, and you will have to delete the original share from Sharing.

**Folder being shared:** Sports

**Group Description:** Sports links

Please use the short form below to set up this share of folder Sports.

To whom would you like to grant access? Enter the first few characters of a user's last name, or user name, or of a Group's name, click the appropriate button underneath the search box to indicate what kind of search you are performing, and hit the Search button.

**Search String:**

keith

**Search Type:**

By Last Name     By User Name     By Group Name

Counsell, Keith (keith)

What permissions should be granted on  
Sports?

Read     Write

177

**FIG. 17**

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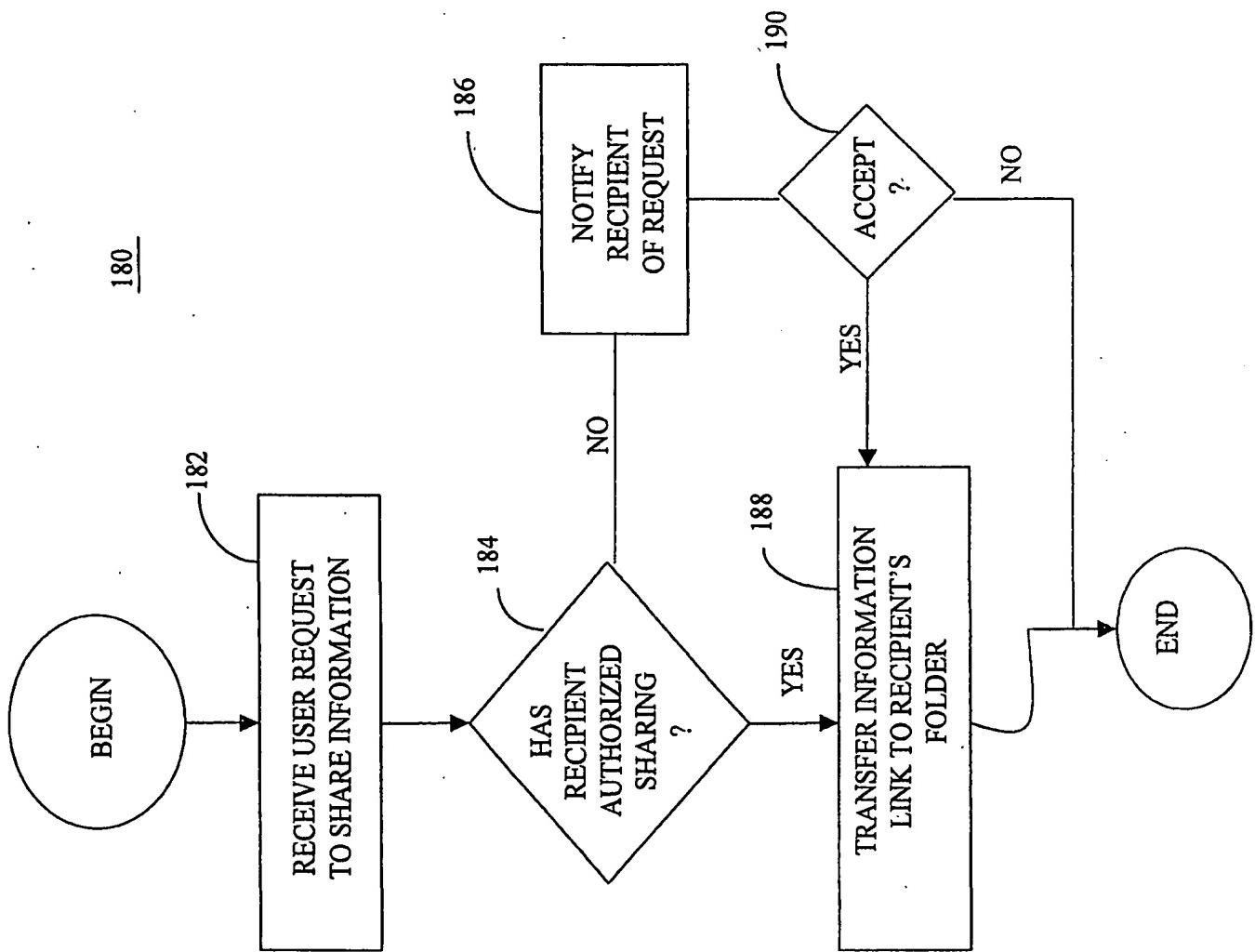


FIG. 18

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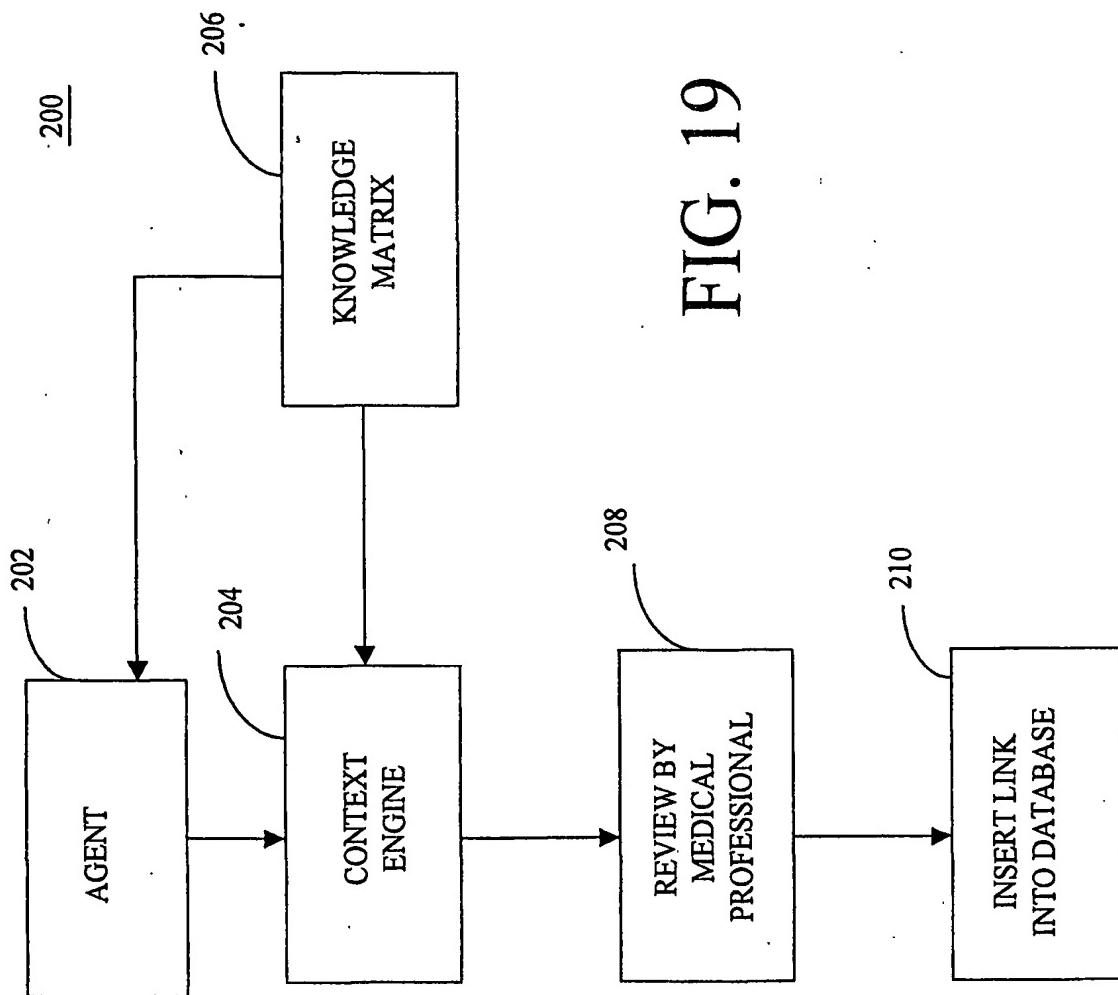


FIG. 19

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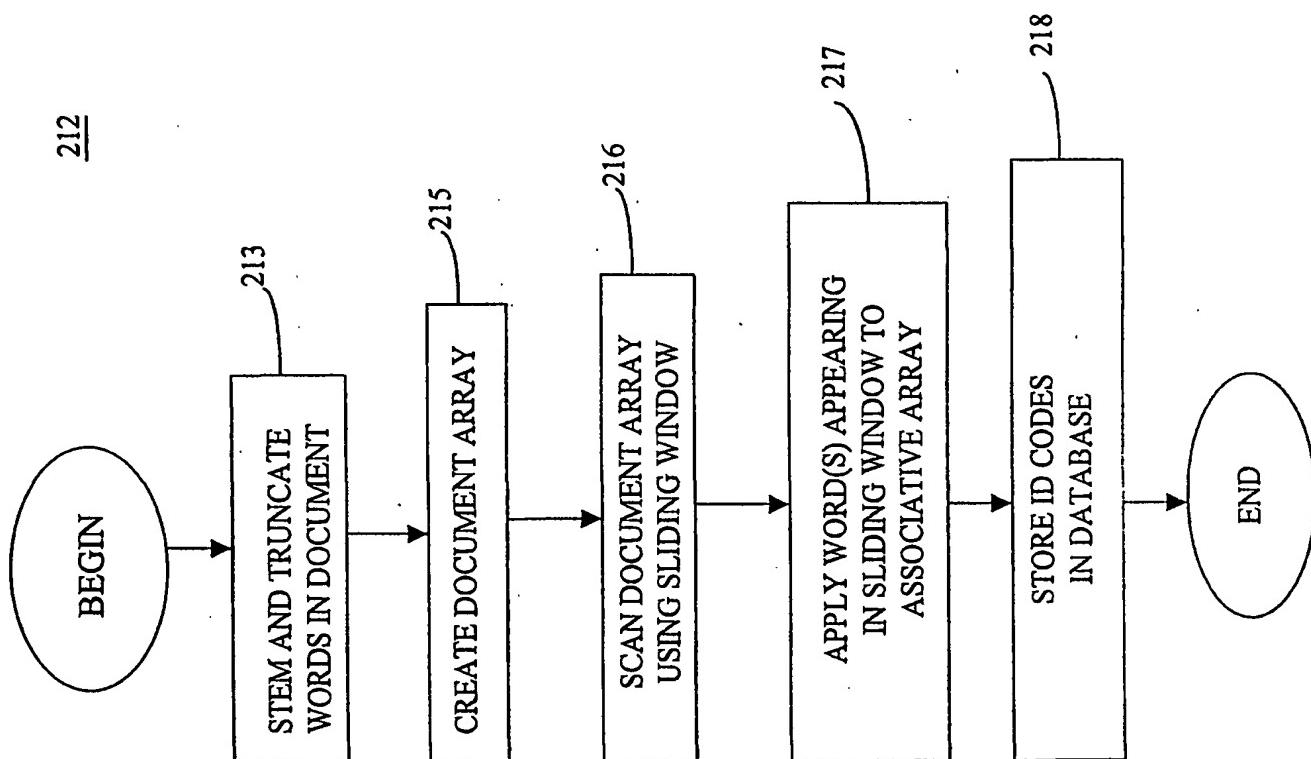


FIG. 20

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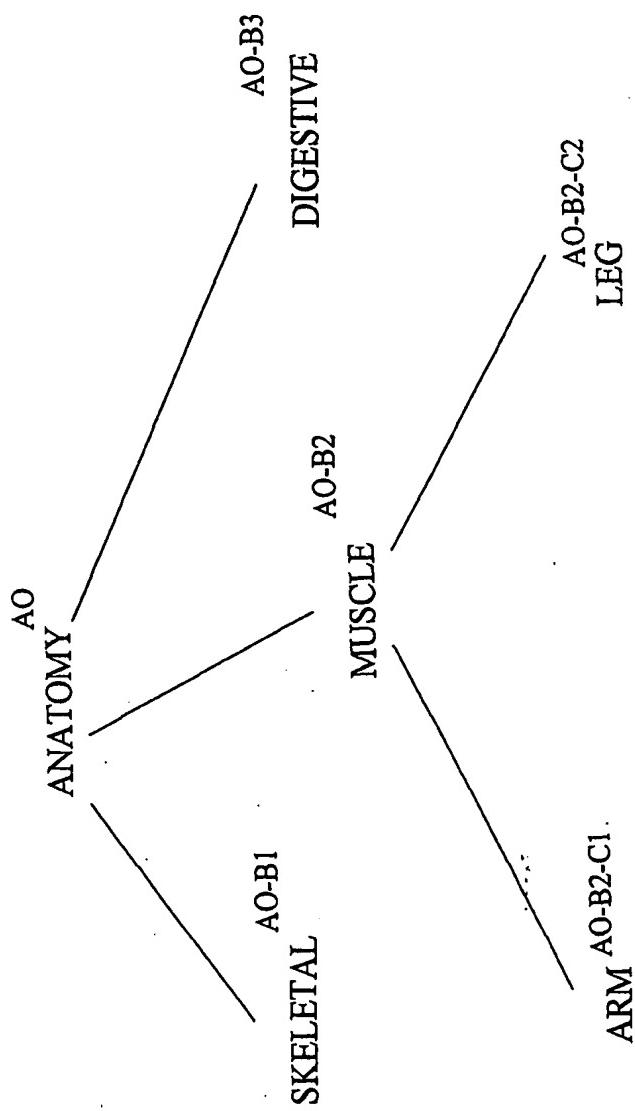
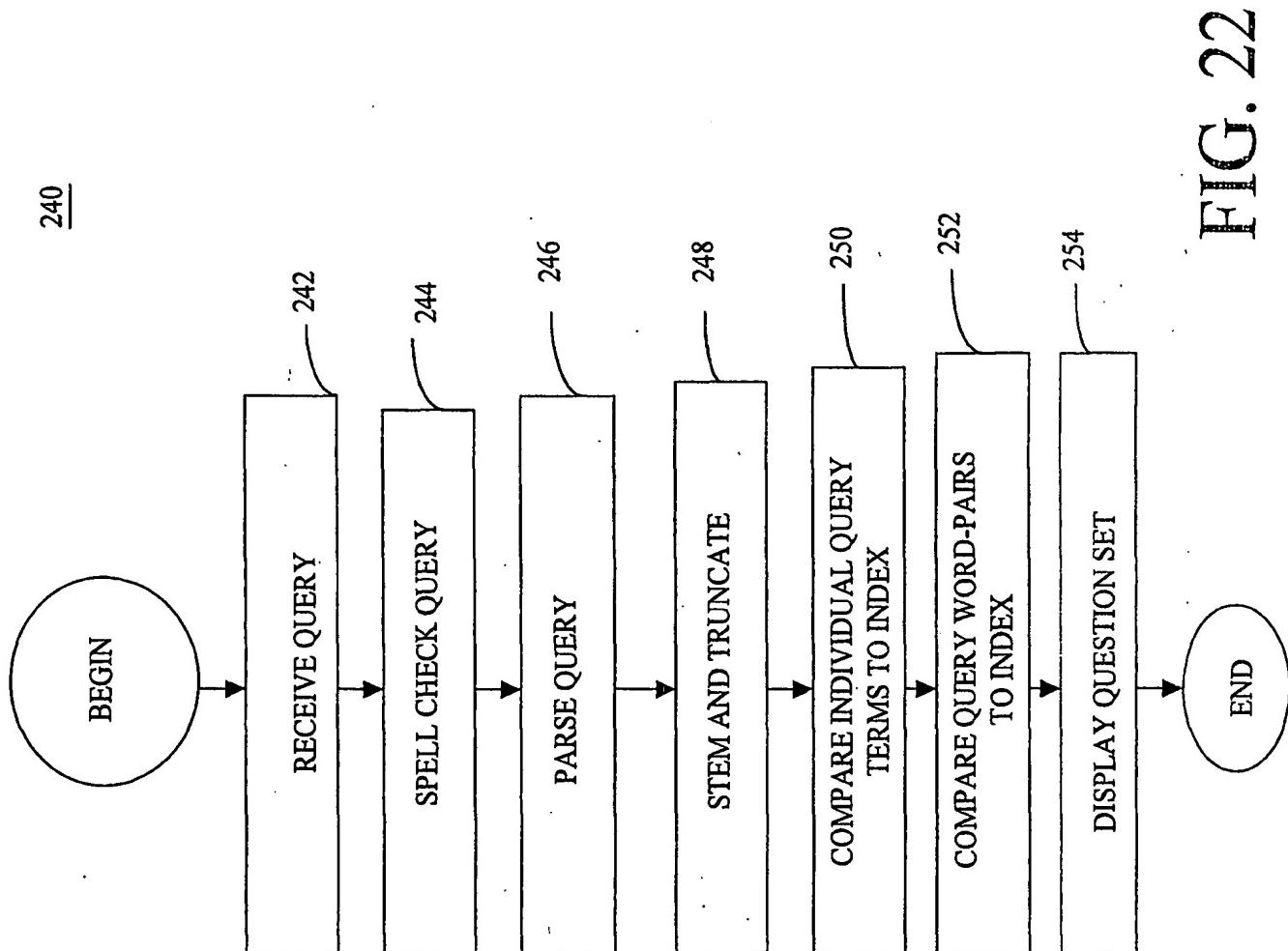
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FIG. 21

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264 → 262 ↗ 260 ↙

how do you get lyme disease  Search Help

Diseases  Mental Health  Therapy and Procedures  Anatomy  Drugs and Chemicals  Organisms  
266 →  Check Spelling

You asked: how do you get lyme disease

I know the answer to these questions. Click the  button next to the best one.

 Where can I find a wide variety of information about **Lyme Disease** ?

 Where can I find images and illustrations of **Lyme Disease** ?

 Where can I find general information about **Lyme Disease** ?

 Where can I find information in the Merck Manual about **Lyme Disease** ?

 Where can I find recent news about **Lyme Disease** ? 270 ↙

 What drugs are used with **Lyme Disease** ?

 What are the Clinical Trials for **Lyme Disease** ?

 What is the latest scientific research on **Lyme Disease** ?

 Where can I find encyclopedia articles regarding **Lyme Disease** ?

268 ↗ ↑ 272

FIG. 23

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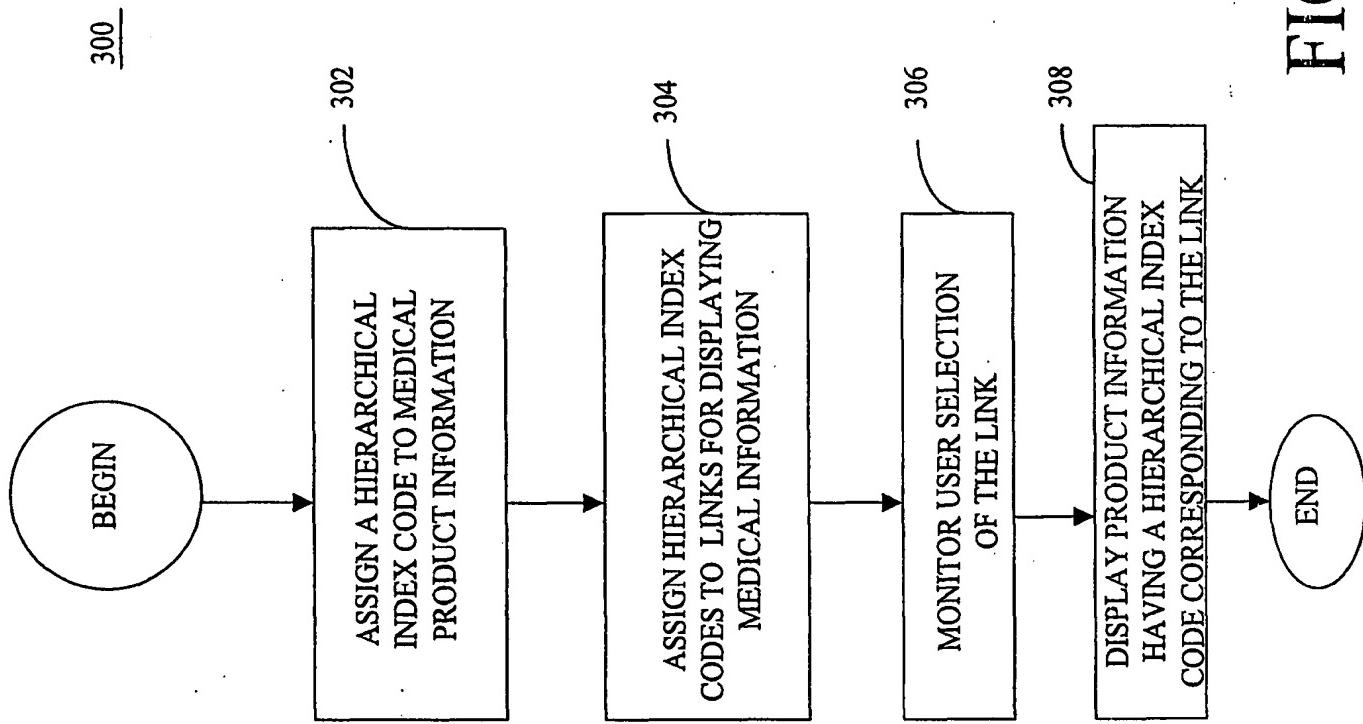


FIG. 24

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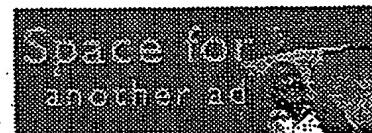
356

357

Definitions: On Off ← Help

358

Home : Diseases : Bacteria and Fungus Infections, Infections [Bacterial Infections and Mycoses] : Bacterial Infections : Gram-Negative Bacterial Infections : Borrelia Infections : Lyme Disease



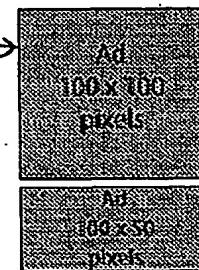
### Illustrations, Images - Lyme Disease

- Deer - carrier of lyme disease
- Erythema chronicum migrans
- Erythema chronicum migrans, primary
- Erythema chronicum migrans, secondary on the leg
- Lyme disease - Borrelia burgdorferi organism
- Lyme disease - checking the body for ticks
- Lyme disease - facial palsy
- Lyme disease - preventative clothing
- Lyme disease on the cover of Newsweek
- Lyme disease organism, Borrelia burgdorferi
- Lyme disease, by the time of onset
- Lyme disease, erythema chronicum migrans
- Lyme disease, graph of clinical features
- Lyme disease, incidence by age and sex
- Lyme disease, incidence by county
- Lyme disease, incidence

Marketplace

355 → Doryx

354



352

← 350

**FIG. 25**

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US01/22130

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G06F 17/00  
US CL : 707/10

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 707/1-206

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST, network, web, browser, e-commerce, service, patient, folder

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,055,512 A (DEAN ET AL.) 25 APRIL 2000, Abstract	1-91
X	US 5,960,403 A (BROWN) 28 SEPTEMBER 1999, Abstract	1-91

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

14 AUGUST 2001

Date of mailing of the international search report

10 SEP 2001

Name and mailing address of the ISA/US  
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Box PCT  
Washington, D.C. 20231

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